MONITORING WELL INSTALLATION AND GROUNDWATER SAMPLING REPORT

Port of Portland
Marine Terminal 1 South
2100 NW Front Avenue
Portland, Oregon

December 19, 2001

HAHN AND ASSOCIATES, INC.
Environmental Management

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Prepared for:

The Port of Portland
Portland, Oregon

Prepared by:

Hahn and Associates, Inc.
Portland, Oregon

HAI Project No. 5106
DEQ ECSI File No. 2642

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HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS

December 19, 2001

Mr. Joe Mollusky
The Port of Portland
P.O. Box 3529
Portland, Oregon 97208

HAI Project No. 5106
DEQ ECSI File No. 2642

Subject: Monitoring Well Installation and Groundwater Sampling Report; Port of Portland Marine Terminal 1 South, 2100 NW Front Avenue, Portland, Oregon

Dear Mr. Mollusky:

1. Introduction

The Port of Portland (the Port) retained Hahn and Associates, Inc. (HAI) to conduct groundwater investigation activities at Marine Terminal 1 South located at 2100 NW Front Avenue, Portland, Oregon (Figure 1). The work activities, conducted in August, September, and October 2001, included the installation, development, and sampling of seven groundwater monitoring wells at the site. The work activities were conducted in response to a July 26, 2001, Oregon Department of Environmental Quality (DEQ) letter[1] requesting further characterization of site groundwater via monitoring well installation and sampling to supplement remedial investigation (RI) activities at the site. All work unless otherwise noted, was conducted according to the Site Characterization Work Plan[2], Work Plan Addendum[3], and the August 7, 2001, DEQ Work Plan Addendum response letter[4] to the Port.

2. Objectives

The primary objectives of the monitoring well installation and sampling activities were to:

1) Establish permanent sampling points for monitoring the shallow groundwater at the site

2) Validate push probe boring data and further determine the magnitude of impacts to groundwater

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[1] Oregon Department of Environmental Quality (2001a). *Comments Remedial Investigation Report, Marine Terminal 1 South, Portland, Oregon, ESCI No. 2642*. July 26, 2001.

[2] Hahn and Associates, Inc. (2000). *Work Plan for Supplemental Site Characterization, Marine Terminal 1 South Redevelopment, 2100 NW Front Avenue, Portland, Oregon*. August 31, 2000.

[3] Hahn and Associates, Inc. (2001b). *Work Plan (Addendum No. 2) For Groundwater Monitoring, 2100 NW Front Avenue, Portland, Oregon*. August 1, 2001.

[4] Oregon Department of Environmental Quality (2001b). *Comments, Work Plan (Addendum No. 2), Marine Terminal 1 South, Portland, Oregon, ESCI No. 2642*. August 7, 2001.

3) Establish background groundwater quality at the site

4) Establish groundwater flow direction beneath the site

5) Collect groundwater data suitable for evaluating the surface water pathway and of sufficient quality to support the site risk assessment.

3. Background

3.1 Current Site Features

The site consists of approximately 21 acres in Marine Terminal 1 that is located northwest of Interstate 405 (Fremont Bridge), northeast of NW Front Avenue, southeast of Slip No. 2, and southwest of the Willamette River (the Site)(Figure 2). Two primary structures, designated as Warehouse No. 2 and House No. 104, are currently located at the Site. Portions of the Site are currently leased by one tenant, Tristar Transload who operates the open storage area southeast of Slip No. 2 and northwest of House No. 104 and portions of House No. 104. The remaining portions of the Site are currently unoccupied. Additionally, an extensive dock structure is present over submerged land at Berths 104, 105, and 106.

The topography at the Site is generally level at an elevation of approximately 30 feet above mean sea level (msl). The Site is generally paved with asphalt or concrete with little or no vegetation or bare ground present.

3.2 Investigations History

In 1998 and 2000, RI activities were conducted at the Site and beneath a portion of NW Front Avenue adjoining the Site. A total of 112 push probe borings were installed for the collection of soil and groundwater samples during the work activities. The initial environmental site assessment (ESA) phase of investigation was conducted by Maul Foster[5]; the subsequent phases of investigation were conducted by HAI and are documented in the RI report[6] prepared for the Site.

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[5] Maul Foster and Alongi, Inc., (1998). *Focused Environmental Site Assessment, Terminal 1, Between Slip No. 2 and the Freemont Bridge, Northwest Portland, Oregon.* August 25, 1998.

[6] Hahn and Associates, Inc. (2001a). *Terminal 1 South Remedial Investigation Report, Port of Portland Marine Terminal 1 South, 2100 NW Front Avenue, Portland, Oregon.* July 12, 2001.

As detailed in the RI report, the nature and extent of contamination at the Site is summarized as follows:

- The contaminants of potential concern (COPCs) identified in Site soils and groundwater are polynuclear aromatic hydrocarbons (PAHs) and three metals (arsenic, copper, and lead).

- Seven general areas/locations of soil impacted with petroleum hydrocarbons have been identified at the Site, including the former Slip No. 1, B-5, B-20, B-29, B-37 (dry well), B-38, and B-102 Areas (Figure 3). The B-102 Area is considered an off-site, up-gradient impact unrelated to Terminal 1 South.

- Two areas contained significant petroleum contamination in soil with COPCs at concentrations above Risk-Based Screening Levels (RBSLs): the B-37 (dry well) Area and the B-38 Area.

- Soil impacts extend to the depth of the water table at the B-37 (dry well) and B-38 Areas.

- Analytical testing detected PAHs in soil at concentrations exceeding RBSLs at the B-20, B-37 (dry well), and B-38 Areas.

- Arsenic was detected in soil at concentrations exceeding the established site background level of 5.3 parts per million (ppm) at borings B-3 and B-11, and in the B-38 Area. Lead was detected in the B-38 Area at concentrations exceeding RBSLs and site background levels.

- Analytical testing of groundwater samples indicates PAHs were detected at concentrations above RBSLs in the B-37 (dry well) and B-38 Areas. Arsenic, copper, and lead were also detected in groundwater at concentrations above RBSLs.

Based on the results of the RI, DEQ requested that additional groundwater investigations be conducted at the Site. The report herein documents the installation of seven groundwater monitoring wells at the Site in August 2001, and groundwater sampling activities conducted in September and October 2001.

4. Field Activities

On August 27, 28, and 29, 2001, HAI supervised the installation of seven groundwater monitoring wells (MW-1 through MW-7) at the Site (Figure 2). On September 6, 7, and 10, 2001, the monitoring wells were developed, and on September 28 and October 1, 2001, groundwater samples were collected from all seven monitoring wells. An additional water level monitoring event was conducted on October 30, 2001.

4.1 Work Plan Modifications

Several modifications to either the Work Plan (Addendum No. 2) (HAI 2001b) or DEQ Work Plan Addendum response (DEQ 2001b) were made during an August 22, 2001, telephone communication with the DEQ (Guy Tanz to Rod Struck) as follows:

Area	Modification	Rational
B-38	Soil samples were not collected from MW-1 or MW-2 borings for laboratory analysis	Push probe sampling already documented impacted soil in these areas
B-37 (Dry Well)	MW-5 was located as proposed in the Work Plan Addendum (No. 2), not at the adjusted location suggested by DEQ	Adjusted well location for future well access
B-37 (Dry Well) and B-38	Analyses for total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), and additional metals (cadmium, chromium, mercury, nickel, silver, and zinc) were analyzed only at key source area wells	If concentrations of target compounds in source area wells are not detected, or are below screening values, they can be eliminated from monitoring at down-gradient wells

4.2 Monitoring Well Installation

On August 27, 28, and 29, 2001, a groundwater monitoring well network consisting of seven (7) shallow monitoring wells was installed at the Site (Figure 3). The monitoring wells were located based on the following criteria:

1) Within and down-gradient of areas of primary groundwater impact, specifically the B-37 (dry well) and B-38 Areas (MW-1 through MW-5)

2) At locations suitable for evaluation of the groundwater to surface water pathway; i.e. along the riverfront (MW-3, MW-5, and MW-7)

3) At locations, wherever practicable, to validate push probe boring data (MW-1, MW-2, MW-3, MW-4, MW-6, and MW-7)

4) In one or more locations that could be used to establish background groundwater quality at the site, if possible (MW-6)

Monitoring wells MW-1, MW-2, and MW-3 were installed in the B-38 Area, monitoring wells MW-4 and MW-5 were installed in the B-37 (dry well) Area, and monitoring wells MW-6 and MW-7 were installed in the southeastern portion of the site.

MW-1, MW-2, and MW-4 were placed at locations in or immediately down-gradient of primary groundwater impact areas to monitor groundwater quality and assess plume stability. Down-gradient monitoring wells MW-3, MW-5, and MW-7 were placed within approximately 75 feet of the Willamette River bank to provide groundwater quality down-gradient of known sources and to evaluate the groundwater to surface water pathway. MW-6 was placed in an up-gradient area to assess background groundwater quality at the Site to provide an additional hydrogeological control point.

Several borings were advanced in the MW-7 Area where augers encountered woody debris. Two samples No. 5106-010827-002 and 5106-010827-003, that were primarily composed of wood, were collected from the first boring installed on August 27, 2001. MW-7 was ultimately constructed on August 29, 2001.

4.2.1 Monitoring Well Installation Procedures

All monitoring well installation work was performed by an Oregon-bonded and licensed monitoring well constructor (Geo-Tech Explorations, Inc. of Tualatin, Oregon). The monitoring wells were installed in accordance with the Oregon Groundwater Law (Oregon Revised Statute (ORS) Chapter 537) and the *Rules for Construction and Maintenance of Monitoring Wells and Other Holes in Oregon* (Oregon Administrative Rules (OAR) Chapter 690, Division 240).

During the drilling of the monitoring well borings, the soils were sampled at 5-foot intervals with a split-spoon sampling device for geologic logging purposes.

The monitoring wells were installed with a hollow stem auger drilling rig equipped with 6-inch and 5/8-inch inside-diameter (ID) hollow stem augers. The monitoring wells were constructed with 2-inch ID, threaded, Schedule 40, polyvinyl chloride (PVC), blank casing and slotted screen. Fifteen (15) feet of 0.010-inch slotted screen was set at the bottom of each well with screen intervals of 17 to 32 feet bgs at all wells with the exception of MW-5 that was installed from 19 to 34 feet bgs to compensate for an elevated loading dock. Blank casing extends from the top of the screen to the ground surface.

The sand pack was placed in the annular space from the bottom of the boring to 2 feet above the top of the screen with a Colorado 10/20 silica sand. The wells were then developed with a surge block to set the sand pack. A well seal composed of 3/8-inch bentonite chips was then placed on top of the sand pack to a depth of 1.5 feet bgs and hydrated.

The monitoring wells were completed with flush well monuments cemented in at the surface. The well casings were fitted with locking caps. A summary of monitoring well construction is in Table 1, and monitoring well construction logs are included in Appendix A.

Following the installation of the monitoring wells, on September 6, 7, and 10, 2001, the monitoring wells were further developed by purging with a pump in an attempt to remove the fine sediment from around the well bore. During development, at least 10 well volumes of water were removed from each well. The parameters of pH, temperature, conductivity,

redox potential, dissolved oxygen, and turbidity were measured for stabilization. All parameters stabilized during the development process with the exception of turbidity due to a faulty meter. However, turbidity was measured with an operable meter during the sampling process (Section 4.2.2) and found to be stable. Accordingly, monitoring well development was deemed complete. Monitoring well development records are in Appendix B.

On September 11, 2001, the relative locations and elevations of the monitoring wells were surveyed to a City of Portland Datum by the Port of Portland (Appendix C).

4.2.2 Monitoring Well Sampling Procedures

On September 28 and October 1, 2001, the groundwater at the 7 monitoring wells was sampled. Prior to sampling, at least 3 well volumes of water were purged from each well using a submersible pump and disposable polyethylene tubing. The pH, temperature, conductivity, redox potential, dissolved oxygen, and turbidity of the water were measured during the purging process to monitor for stabilization of these parameters. Monitoring well purge records are in Appendix B.

Following completion of purging the well, a representative sample of the groundwater was obtained using either the submersible pump [TPH, PAHs, metals, and total suspended solids (TSS)] or a new disposable bailer (VOCs). The water was carefully transferred to the appropriate sampling containers that were completely filled such that no headspace was present that would allow the loss of volatiles. The sample bottles were then transferred to a chilled container for shipment to the analytical laboratory.

The static water levels in all the monitoring wells were measured on September 28, 2001, prior to the sampling event, using a Solinst water level indicator (conductive probe). The water levels were measured from the north side of the top of the casing. An additional water level monitoring event was conducted on October 30, 2001. Static water level measurements are summarized on Table 2; field logs are in Appendix B.

4.3 Decontamination Procedures

All well installation equipment, as well as all reusable soil sampling equipment, were steam-cleaned between boring locations to prevent cross-contamination. In addition, soil sampling equipment was cleaned between each sample using a detergent wash and two tap water rinses. New, disposable tubing and bailers were used between each well location for the groundwater sampling activities. The submersible pump was cleaned between each sample using a detergent wash and two tap water rinses.

4.4 Investigative-Derived Waste

Soil cuttings generated during drilling of the monitoring well borings were placed in 25 55-gallon drums and left on site for future disposal.

Development water, purge water, and decontamination water generated during the drilling and sampling activities was containerized in 11 55-gallon drums and left on site for future disposal.

All investigative-derived waste generated during the RI activities are stored at a secure location between House No. 104 and Warehouse No. 2.

5. Analytical Tests

The soil sample and groundwater samples were shipped with chain-of-custody documentation in sealed and chilled containers to North Creek Analytical in Beaverton, Oregon, for analysis.

One select soil sample, collected from the boring at MW-6 to assess for its suitability as a background well, as per DEQ Work Plan Addendum No. 2 Comments (DEQ 2001b), was analyzed for the following parameters:

Parameter	Analytical Method
Diesel-Range Petroleum Hydrocarbons	NW (Northwest) TPH-Dx
Oil-Range Petroleum Hydrocarbons	NW TPH-Dx
VOCs	Environmental Protection Agency (EPA) 8260B
PAHs	EPA 8270 SIM
Priority Pollutant Metals *	EPA 6010/7000 Series

* Antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, zinc

The results of the analytical testing for the soil sample are summarized on Table 3; the laboratory reports and chain-of-custody documentation are included in Appendix D.

Groundwater samples collected during the groundwater monitoring activities were analyzed for the following parameters:

Parameter	Analytical Method
Diesel-Range Petroleum Hydrocarbons	NW TPH-Dx
VOCs	EPA 8260B
DEHP	EPA 8270C
PAHs	EPA 8270 SIM
Total Suspended Solids	EPA 160.1
Priority Pollutant Metals:	
unfiltered[1] and filtered[2]	EPA 6010/7470A

1 - antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, zinc
2 - arsenic, copper, lead

The results of the analytical testing for the groundwater samples collected during the September/October 2001 groundwater sampling event are summarized in Tables 4 and 5, and are compared to previous push probe boring results in Tables 6 and 7. The laboratory reports and chain-of-custody documentation for September/October 2001 groundwater sampling event are included in Appendix E.

6. Results and Discussion

6.1 Subsurface Conditions

The geologic units of interest at and in the vicinity of the Site were previously discussed in the RI report (HAI 2001a). Generally, as indicated in the Preliminary Assessment[7], much of the property has been extensively filled-in through time with mixtures of gravel, sand, silty sand, and silt. Fill materials were observed in all monitoring well borings to the maximum depth of investigation at 34.5 feet bgs similar to what was encountered in push probe borings during RI activities.

What appeared to be sand, silty sand, and silt fill was encountered to the maximum depth (up to 34.5 feet bgs) in all monitoring well borings, with the exception of MW-6 where predominantly gravel fill was encountered to a depth of approximately 20 feet bgs.

[7] Port of Portland (2000). *Preliminary Assessment, Port of Portland Terminal 1, 2200 NW Front Street, Portland, Oregon, 97209*. September 18, 2000.

6.2 Site Hydrogeology

On September 28 and October 30, 2001, groundwater was encountered in the monitoring wells at depths ranging from 18.5 feet (MW-1) to 29.3 (MW-7) feet below top of casing, or elevations of 4.1 to 11.9 feet mean sea level (msl)(Table 2)

Groundwater elevations on September 28 and October 30, 2001, indicate a general flow to the northeast towards the Willamette River with a decline or even reversal of the gradient near the river (Figure 4). Groundwater elevations at MW-5 appear to be anomalously high, possibly due to river wall construction in this area.

6.3 Screening Levels

Soil and groundwater analytical testing results were compared to risk-based screening levels (RBSLs) to screen for potential risks to human health and ecological receptors. U.S. Environmental Protection Agency (EPA) Region 9 Preliminary Remediation Goals (PRGs) were used as RBSLs for human health. Since the surrounding area is commercial and residential, and the future contemplated land use of the Site is commercial and residential, Site soil and groundwater impacts were compared to residential PRGs.

Additionally, DEQ Ecological Benchmark Screening Levels (EBSLs), where established, were utilized to screen groundwater results for a preliminary risk evaluation of the "groundwater to surface water pathway".

6.4 Soil Sampling Results

Field screening of soil samples from the monitoring well borings did not indicate the presence of possible soil contamination with the exception of samples at 30 feet bgs in MW-1 and at depths of 4.5 to 11.0 feet bgs in MW-6, which displayed slight sheen but no odor or discoloration. Otherwise, evidence of soil contamination was not observed at other depths or well borings.

One soil sample was selected for laboratory analysis at MW-6 (5 feet bgs) to assess this well location for its representativeness as a background groundwater quality monitoring well. Soil samples were not collected from the MW-1 boring since this area had previously been extensively characterized during the RI activities.

The analytical testing of the soil sample collected at 5.0 feet bgs at MW-6 did not detect diesel- and/or oil-range petroleum hydrocarbons, VOCs, or PAHs above laboratory reporting limits (Table 3). Various metals were detected above reporting limits; however, only arsenic, detected at a concentration of 3.37 ppm, exceeded its PRG screening level of 0.39 ppm. However, the MW-6 soil sample arsenic concentration is below the background level of 5.3 ppm for arsenic, established in the RI (HAI 2001a). Accordingly, the arsenic detected in the MW-6 boring is attributed to naturally occurring background concentrations. Further, where reference values are available, all other concentrations of

metals are within the range of naturally occurring background concentrations. It appears that the location of MW-6 is suitable for evaluating background groundwater quality at the site.

6.5 Groundwater Sampling Results

The groundwater sampling program followed a sampling and analysis plan (Table 8) designed to address the following four objectives:

1) Validate push probe boring data and further determine the magnitude of impacts to groundwater

2) Establish a background groundwater monitoring well, if possible

3) Collect groundwater data suitable for evaluating the "groundwater to surface water pathway" at the site

4) Collect groundwater data of sufficient quality to support a risk assessment.

6.5.1 Groundwater Analytical Testing Results

The groundwater results are summarized below and on Tables 4 and 5.

- Diesel-range or oil-range petroleum hydrocarbons were not detected above laboratory reporting limits in groundwater at MW-4 (B-37 Area). Oil-range petroleum hydrocarbons were not detected above laboratory reporting limits at MW-1 (B-38 Area), but diesel-range petroleum hydrocarbons were detected at a concentration of 416 parts per billion (ppb). The diesel-range petroleum hydrocarbons detected at MW-1 are flagged in the analytical report as having non-petroleum peaks suggesting the presence of biogenic interference (e.g., organic matter within the fill). This suggests the detected concentrations of diesel-range petroleum hydrocarbons in groundwater at MW-1 may be an overestimate of actual groundwater quality.

- Benzene, toluene, ethylbenzene, and xylene (BTEX) compounds were not detected in primary source area monitoring wells MW-1 (B-38 Area) or MW-4 (B-37 Area).

- One halogenated VOC, tetrachloroethene (PCE), was detected in MW-1 at a concentration of 3.29 ppb, which exceeds the EPA PRG of 1.1 ppb for tap water. This is the first detection of any halogenated VOC at the Terminal 1 South site. The source of the detected PCE is likely from an up-gradient off-site source.

- PAHs were present at low concentrations (less than 2.1 ppb total PAHs) in five of seven monitoring wells (MW-2, MW-3, MW-4, MW-5, and MW-7) (Table 5, Figure 5). The detected PAHs, all non-carcinogenic, were present at concentrations below both RBSLs and EBSLs. PAHs were not detected above laboratory reporting limits at MW-1 (B-38 Area) or MW-6.

- DEHP was not detected above laboratory reporting limits in MW-1, MW-2, MW-6, or MW-7. DEHP results are further discussed in section 6.5.3.

- Of the nine total (unfiltered) metals analyzed (Table 4), arsenic at all well locations, and lead at one location (MW-3), were detected in groundwater at concentrations above RBSLs for tap water. Concentrations of total arsenic ranged from 1.06 to 14 ppb, exceeding the EPA PRG for tap water of 0.045 ppb. Although there is no PRG established for lead in groundwater, lead at MW-3 was detected at a concentration of 36.2 ppb, which is above the Safe Drinking Water Act (SDWA) action level of 15 ppb. Total lead at MW-3 and MW-7 was detected at concentrations of 36.2 and 4.47 ppb, respectively, above the EBSL of 3.2 ppb. In addition, total copper at MW-3 detected at a concentration of 40.2 ppb exceeded an EBSL of 12 ppb.

- Analysis of dissolved (filtered) arsenic, copper, and lead was conducted at all well locations. The filtered concentrations of arsenic remained largely unchanged from unfiltered concentrations at all wells. A reduction of arsenic to non-detect levels was observed in the filtered samples at MW-1 and MW-7. Concentrations of copper and lead were reduced to non-detect levels in the filtered samples with the exception of MW-1. It is assumed the filtered groundwater samples are more representative of actual groundwater quality at the Site than unfiltered samples.

In summary, the results of the groundwater sampling at the monitoring wells indicates only four chemicals were found at concentrations that exceed RBSLs and/or EBSLs: arsenic, copper, lead, and PCE. Copper and lead concentrations dropped to below RBSLs and EBSLs in filtered samples. PAHs, although detected at most wells at the site, were found at concentrations well below RBSLs and EBSLs. The source of PCE detected in MW-1 is likely from an up-gradient off-site source. Arsenic may be attributed to naturally occurring background conditions.

6.5.2 Monitoring Well - Push Probe Comparison

The analytical results at six monitoring well/push probe pairs, MW-1/B-38/39, MW-2/B-77, MW-3/B-105, MW-4/B-87, MW-6/GW-1, and MW-7/GW-4, were compared to assess for trends between screening level push probe groundwater sample results versus monitoring well sample results (Tables 6 and 7). A push probe boring counterpart was not present in near proximity of MW-5 for comparison.

In general, PAH concentrations are lower or not detected in the monitoring well samples, as compared to their counterpart push probe samples, on both a constituent and total basis. Most significant, was the reduction of carcinogenic PAHs in push probe samples to non-detectable levels in the groundwater samples. The greatest difference in PAH concentrations was found at MW-4 versus B-87 for total PAHs, 32.3 ppb to 1.7 ppb respectively. Similarly, in general lower dissolved arsenic, copper, and lead concentrations were observed in the monitoring well samples compared to the push probe groundwater samples.

The comparison of push probe versus monitoring well groundwater samples at T1S indicate that the push probe sampling data overestimated PAH and metals concentrations in groundwater. The push probe methodology for collecting screening-level groundwater samples will typically result in more turbid samples containing suspended and colloidal material that may contain contaminants.

The most significant observation is that carcinogenic PAHs in push probe samples, which exceeded RBSLs and EBSLs, were not detected in the monitoring well samples. Therefore, PAHs are not contaminants of concern in groundwater at T1S.

DEHP was previously detected in screening-level groundwater samples from push probes at B-39, GW-1, and GW-4, but was not detected in monitoring well counterparts MW-1, MW-6, or MW-7. This information indicates DEHP is not present in the groundwater at the site, and its presence in some screening-level groundwater samples was from either laboratory and/or equipment contamination. DEHP no longer appears to be a contaminant of interest at the Site, and can be eliminated from further analysis.

6.5.3 Background Groundwater Conditions

Based on its location, MW-6 appears to be the best candidate for a background monitoring well at the Site. Analytical testing of the groundwater sample from MW-6 did not detect PAHs or DEHP above laboratory reporting limits. Of four total (unfiltered) metals analyzed, arsenic and lead were detected at concentrations of 2.72 and 2.51 ppb; copper was not detected above laboratory reporting limits. The concentration of arsenic of 2.72 ppb exceeds its RBSL of 0.045 ppb. There is no PRG established for lead in groundwater; however, the lead detected at a concentration of 4.47 ppb is below the Safe Drinking Water Act (SDWA) action level of 15 ppb. The detected concentrations of arsenic and lead in groundwater at the Site are within background concentrations for an uppermost water-bearing zone for this area. It appears the location of MW-6 may be used to assess baseline groundwater quality at the Site.

6.5.4 Groundwater Quality Data Validation

The analytical data collected by HAI for the groundwater sampling conducted in September and October 2001 was assessed to ensure that it is of acceptable quality. The analytical data was subjected to a review of all field and laboratory quality assurance/quality control (QA/QC) measures.

A review of the groundwater QA/QC data is summarized below:

- All samples were analyzed within appropriate holding times.
- All samples showed acceptable surrogate recoveries with one exception as described below.
- No contaminants were detected in laboratory method blanks.
- Equipment calibration and laboratory control standards (LCS) were within acceptable ranges.
- All matrix spike (MS) and matrix spike duplicate (MSD) recoveries were within acceptable ranges.
- All continuing calibration verification (CCV) standards were within acceptable limits.
- All MS/MSD relative percent differences (RPD) were within acceptable limits.
- All laboratory batch sample duplicates showed acceptable RPDs, with one exception described below.
- The field groundwater duplicate sample collected from MW-1 was within a RPD of 21% for TPH, 18% for PCE, and 62% for arsenic; all other metals were below an RPD of 23% (zinc).
- The equipment blank did not detect VOCs or DEHP above method detection limits.

Data qualifiers identified in the laboratory analytical reports are described in detail to assess their impact on groundwater data quality.

NCA Report No. P1J0097, Page 2 of 31 (Appendix D): Concentrations of diesel-range organics in sample no. 5106-011001-108 and no. 5106-011001-109 were flagged "D-15" indicating the detected hydrocarbons have non-petroleum peaks suggesting the presence of biogenic interference. The results suggest the detected diesel-range organics may be an overestimate, if present, in the sample.

NCA Report No. P1J0097, Page 14 of 31 (Appendix D): Surrogate recoveries for sample no. 5106-011001-109 were flagged "A-10" and "S-08" indicating actual surrogate recoveries were believed to be one-half the reported values, and that the surrogate recovery was above control limits. However, since no analytes were detected in the sample, the quality of the data has not been affected.

NCA Report No. P1J0097, Page 20 of 31 and NCA Report No. P1J0098, Page 16 of 27 (Appendix D): The batch sample duplicate for copper and lead were flagged "Q-06" since the RPDs exceeded the RPD limit of 20. Although the RPD between the sample result and duplicate result was greater than 20, the original result was less than five times the laboratory reporting level, therefore the RPD is not applicable and the batch analysis remains valid for this compound.

Based on the QA/QC review, it appears the data collected during the September/October 2001 sampling event are of sufficient quality for groundwater quality assessment purposes. There are circumstances where groundwater detection limits are above risk-screening levels or ecological benchmark values due to industry standard method capabilities. Accordingly, this data will be evaluated by alternative means in the risk assessment as described in the Risk Assessment Work Plan[8].

6.5.5 Revised Groundwater Monitoring and Analysis Plan

Based on the groundwater analytical results, an updated groundwater monitoring and analysis plan is presented in Table 8. The revised plan includes additional analysis of groundwater for VOCs at MW-1, MW-2, and MW-3; a trip blank for VOCs is also proposed. The revised plan eliminates further analysis at MW-4 for TPH and VOCs since the September/October 2001 sampling event did not detect these compounds. Since the presence of DEHP in screening level groundwater samples has been attributed to either laboratory and/or equipment contamination, it has been eliminated from further testing. Analysis for PAHs, unfiltered and filtered arsenic, copper, and lead, and total suspended solids will be conducted at each of the seven monitoring wells. The next groundwater sampling event is scheduled for January 2002.

6.6 Supplemental Water Well Beneficial Use Research

The DEQ requested further research relating to six water wells identified in the RI report (HAI 2001) that fell within a one-half mile radius of the Terminal 1 South Site. The status of each of the six wells was assessed by conducting additional research and interviews of property owners and/or managers (Appendix F). Property owners and/or facility managers were identified for Wells 1 through 5. Of those five wells, none were reported to be in use. The location and/or use of Well 6 installed for the "Ice Coliseum" could not be determined. The reported location of Well 6 is in Section 33, which places this well at least 1,000 feet up-gradient of the Site.

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[8] Hart Crowser, Inc. (2001). *Risk Assessment Work Plan, Marine Terminal 1 South, 2100 NW Front Avenue, Portland, Oregon*. September 14, 2001.

7. Conclusions

Monitoring well installation and groundwater sampling activities were conducted at the Terminal 1 South property in September and October 2001. Groundwater samples were collected from all seven monitoring wells that were installed at the site.

The subsurface soils encountered during the monitoring well installation were predominantly sands and silts with occasional gravel fill to the maximum depth of investigation of 34.5 feet bgs. Groundwater elevations in six of seven monitoring wells in September and October 2001 indicate a general groundwater flow directions towards the Willamette River. Groundwater elevations at MW-5 appear anomalously high, possibly due to sea wall construction.

The groundwater sampling results at the seven monitoring wells indicate that only four chemicals were found at concentrations that exceed RBSLs and/or EBSLs: arsenic, copper, lead, and PCE. Copper and lead concentrations in groundwater dropped to below RBSLs and EBSLs in filtered samples. The source of the PCE detected in groundwater at MW-1 is likely from an up-gradient, off-site source. PAHs were found at concentrations well below RBSLs and EBSLs. Arsenic may be attributed to naturally occurring background conditions.

The comparison of groundwater samples at six monitoring well/push probe pairs indicate PAH concentrations are consistently lower or not detected in monitoring well groundwater samples as compared to push probe samples. Significantly, carcinogenic PAH concentrations in RI push probe groundwater samples which exceeded RBSLs and EBSLs, were not detected in the monitoring well samples. Therefore, PAHs are not contaminants of concern in groundwater at T1S. Also, lower dissolved arsenic, copper, and lead concentrations were generally observed in the monitoring well samples compared to the push probe groundwater samples.

Based on the groundwater sampling results, a revised groundwater sampling plan was developed for the next groundwater sampling event.

8. Limitations

The samples discussed in this report were collected, analyzed, and interpreted following the standards of care, skill, and diligence ordinarily provided by a professional in the performance of similar services as of the time the services were performed. This report and the conclusions and/or recommendations contained in it are based solely upon physical sampling and analytical activities that were conducted. The data presented in this report document only the concentrations of the target analytes in the particular sample and not the property as a whole.

If there are any comments or questions, please contact the undersigned. Thank you for the opportunity to be of service.

Sincerely,

Guy H. Tanz, R.G.
Associate

GLOSSARY OF ABBREVIATIONS

bgs	below existing ground surface
BTEX	benzene, toluene, ethylbenzene, xylene
COI	contaminant of interest
COPCs	contaminants of potential concern
DEHP	Bis(2-ethylhexyl)phthalate
EBSL	ecological risk-based screening level
ESA	environmental site assessment
EPA	U.S. Environmental Protection Agency
FS	feasibility study
HAI	Hahn and Associates, Inc.
HCID	hydrocarbon identification
LOF	locality of facility
Maul Foster	Maul Foster and Alongi, Inc.
msl	mean sea level
NW	northwest
OAR	Oregon Administrative Rules
DEQ	Oregon Department of Environmental Quality
OWRD	Oregon Water Resources Department
PAHs	polynuclear aromatic hydrocarbons
Port	the Port of Portland
ppb	parts per billion
ppm	parts per million
PRGs	EPA Region 9 Preliminary Remedial Goals
RBSL	risk-based screening level
RI	remedial investigation
SVOCs	semi-volatile organic compounds
TPH	total petroleum hydrocarbons
ug/l	micrograms per liter (ppb)
VCP	Voluntary Cleanup Program
VOCS	volatile organic compounds

TABLES

TABLE 1 - Monitoring Well Construction Summary

Monitoring Well Installation and Groundwater Sampling
Port of Portland Terminal 1 South
2100 NW Front Avenue
Portland, Oregon

Project No. 5106

Monitoring Well Number	OWRD Number	Start Card Number	Drilling Contractor	Date Installed	Installation Method	Well Diameter (inches)	Screen Type	Slot Size (inches)	Sand Pack	Ground Surface Elevation (feet msl)	Top of Casing Elevation (feet msl)	Boring Depth (feet bgs)	Screen Length (feet)	Screen Interval (feet bgs)	Top Screen Elevation (feet msl)	Base Screen Elevation (feet msl)	Groundwater Elevation 10/30/01 (feet msl)	
MW-1	L51482	135244	GeoTech Explorations	28-Aug-01	Hollow-Stem Auger	2	Slotted PVC	0.010	10-20	30.68	30.39	33.5	15.0	17 - 32	13.7	-1.3	11.73	11
MW-2	L51483	135245	GeoTech Explorations	28-Aug-01	Hollow-Stem Auger	2	Slotted PVC	0.010	10-20	28.45	28.16	33.0	15.0	17 - 32	11.5	-3.6	4.05	14
MW-3	L51484	135246	GeoTech Explorations	28-Aug-01	Hollow-Stem Auger	2	Slotted PVC	0.010	10-20	27.97	27.56	33.0	15.0	17 - 32	11.0	-4.0	4.13	13
MW-4	L51480	135242	GeoTech Explorations	27-Aug-01	Hollow-Stem Auger	2	Slotted PVC	0.010	10-20	30.25	29.84	32.0	15.0	17 - 32	13.3	-1.8	4.84	16
MW-5	L51486	135248	GeoTech Explorations	29-Aug-01	Hollow-Stem Auger	2	Slotted PVC	0.010	10-20	33.23	33.04	34.5	15.0	19 - 34	14.2	-0.8	6.09	17
MW-6	L51481	135243	GeoTech Explorations	28-Aug-01	Hollow-Stem Auger	2	Slotted PVC	0.010	10-20	30.62	30.25	32.0	15.0	17 - 32	13.6	-1.4	7.88	12
MW-7	L51485	135247	GeoTech Explorations	29-Aug-01	Hollow-Stem Auger	2	Slotted PVC	0.010	10-20	33.76	33.51	33.0	15.0	17 - 32	16.8	1.8	4.62	18

bgs = below ground surface msl = mean sea level OWRD = Oregon Department of Water Resources PVC = polyvinyl chloride

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Updated: 12/11/01 GHT
File: 5106-01 MW Const Table

TABLE 2

Summary of Water Level Measurements and Elevations

Monitoring Well Installation and Groundwater Sampling
Port of Portland Marine Terminal 1 South
2100 NW Front Avenue
Portland, Oregon

HAI Project No. 5106

Elevation of Top of Casing

Survey Date	Elevation of Top of Casing (feet msl)						
	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
10-Sep-01	30.39	28.16	27.56	29.84	33.04	30.25	33.51

Measured Water Level

Date Measured	Measured Water Level (feet btc)						
	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
28-Sep-01	18.53	23.97	23.46	24.93	26.96	22.41	29.25
30-Oct-01	18.66	24.11	23.43	25.00	26.95	22.37	28.89

Elevation Data

Date/Time Measured	Groundwater Elevation (feet msl) [1]						
	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
28-Sep-01	11.86	4.19	4.10	4.91	6.08	7.84	4.26
30-Oct-01	11.73	4.05	4.13	4.84	6.09	7.88	4.62

NOTE: btc - below top of casing
msl = mean sea level

1 = City of Portland datum

TABLE 3 – Summary of Analytical Results for Soil Sample

Monitoring Well Installation and Groundwater Sampling
Port of Portland Terminal 1 South
2100 NW Front Avenue
Portland, Oregon

Project No. 5106

Analytical Methods and Parameters	Analytical Results mg/kg (ppm)	Reference Levels mg/kg (ppm)
Boring Number ==>	MW-6	EPA PRG for
Sample Depth (feet bgs) ==>	5.0	Residential Soil
Sample Number ==>	5106-010928-004	
Sample Date ==>	28-Sep-01	
Northwest Method TPH-Dx		-
Diesel-Range TPH	ND>25	-
Oil-Range TPH	ND>50	-
PAHs by EPA 8270	ND>0.0268	-
VOCs by EPA Method 8260B	ND	-
Total Metals by EPA 6010		
Antimony	ND>0.5	31.
Arsenic	**3.37**	0.39
Beryllium	ND>0.5	150.
Cadmium	ND>0.5	37.
Chromium	15.8	210.
Copper	17.8	2,900.
Lead	20.4	400.
Mercury	ND>0.1	23.
Nickel	19.3	1,600.
Selenium	ND>0.5	390.
Silver	ND>0.5	390.
Thallium	ND>0.5	5.2
Zinc	50.9	23,000.

Note: bgs = below ground surface
DEQ = Oregon Department of Environmental Quality
EPA = U.S. Environmental Protection Agency
mg/kg = milligrams/kilogram
ND = not detected
PAHs = polynuclear aromatic hydrocarbons
ppm = parts per million
PRG = EPA Region 9 Preliminary Remediation Goal
TPH = total petroleum hydrocarbons
VOCs = volatile organic compounds

Bold = Concentration in excess of reference level

TABLE 4 - Summary of Analytical Results for Groundwater Samples
Monitoring Well Installation and Groundwater Sampling
Port of Portland Marine Terminal 1 South
2100 NW Front Avenue
Portland, Oregon

Project No. 5106

Boring Number	Screen Interval (feet bgs)	Sample Number	Sample Date	Analytical Results ug/l (ppb)																								
				NW TPH-Dx		VOCs by EPA Method 8260B						EPA Method 8270		Total and Dissolved Metals by EPA Method 6010/7000 Series												EPA Method 160.1
				Diesel-Range	Oil-Range	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	Other VOCs	Total PAHs (Table 5)	DEHP	Arsenic	Arsenic (filtered)	Cadmium	Chromium	Copper	Copper (filtered)	Lead	Lead (filtered)	Mercury	Nickel	Silver	Zinc	Total Suspended Solids
MW-1	17 - 32	5106-011001-108	1-Oct-01	416.[1]	ND>500	ND>1	ND>1	ND>1	ND>2	ND>2	PCE=2.76	ND	ND>10	2.01	ND>1	ND>1	3.25	4.74	2.29	1.16	1.37	ND>0.2	5.25	ND>1	10.6	36.
MW-1 (duplicate)	17 - 32	5106-011001-109	1-Oct-01	338.[1]	ND>500	ND>1	ND>1	ND>1	ND>2	ND>2	PCE=3.29	ND	ND>10	1.06	ND>1	ND>1	2.65	3.88	2.03	ND>1	ND>1	ND>0.2	4.49	ND>1	8.43	35.
MW-2	17 - 32	5106-011001-107	1-Oct-01	-	-	-	-	-	-	-	-	2.1	ND>10	12.8	14.5	-	-	ND>2	ND>2	ND>1	ND>1	-	-	-	-	55.
MW-3	17 - 32	5106-010928-103	28-Sep-01	-	-	-	-	-	-	-	-	0.3	-	14.	11.	-	-	40.2	ND>2	36.3	ND>1	-	-	-	-	720.
MW-4	17 - 32	5106-010928-104	28-Sep-01	ND>250	ND>500	ND>1	ND>1	ND>1	ND>2	ND>2	ND	1.7	-	6.45	6.51	ND>1	5.12	4.48	ND>2	2.49	ND>1	ND>0.2	3.86	ND>1	9.06	130.
MW-5	19 - 34	5106-010928-102	28-Sep-01	-	-	-	-	-	-	-	-	1.8	-	13.1	11.3	-	-	2.95	ND>2	1.46	ND>1	-	-	-	-	108.
MW-6	17 - 32	5106-010928-105	28-Sep-01	-	-	-	-	-	-	-	-	ND	ND>10	2.72	3.65	-	-	2.51	ND>2	ND>1	ND>1	-	-	-	11.6	60.
MW-7	17 - 32	5106-011001-106	1-Oct-01	-	-	-	-	-	-	-	-	0.3	ND>10	1.38	ND>1	-	-	ND>2	ND>2	4.47	ND>1	-	-	-	-	ND>20
Equipment Blank	-	5106-011001-110	1-Oct-01	-	-	ND>1	ND>1	ND>1	ND>2	ND>2	ND	-	ND>10	-	-	-	-	-	-	-	-	-	-	-	-	-
EPA PRG for Tap Water -->				-	-	0.35	720.	1,300.	1,400.	6.2	PCE=1.1	-	4.8	0.045	0.045	15.	110.	1,400.	1,400.	15.[1]	15.[1]	11.	730.	150.	11,000.	-
DEQ Ecological Level II Screening Benchmark Value-->				-	-	130.	9.8	7.3	1.8	620.	PCE=240	-	3.	48.	48.	1.1	11.	12.	12.	3.2	3.2	0.012	160.	0.12	110.	-

Note:
bgs = below ground surface
DEHP = bis(2-ethylhexyl)phthalate
EPA = U.S. Environmental Protection Agency
ND = not detected above detection limit indicated
DEQ = Oregon Department of Environmental Quality
PAHs = polynuclear aromatic hydrocarbons
PCE = tetrachloroethene
ppb = parts per billion
PRG = EPA Region 9 Preliminary Remediation Goal (11/00)
TPH = total petroleum hydrocarbons
ug/l = micrograms per liter
VOCs = volatile organic compounds

1 = EPA Primary Drinking Water Regulation action level
2 = The hydrocarbon pattern suggests biogenic interference

Bold = Concentration in excess of EPA PRG for tap water
Shaded = Concentration in excess of Ecological Benchmark Screening Value

Updated: 12/11/01 GHT
File Name: *5106-04/5/6/7 GW Rslts PRG

HAHN AND ASSOCIATES, INC.

TABLE 5 - Summary of Analytical Results for Groundwater Samples: PAHs by EPA Method 8270

Monitoring Well Installation and Groundwater Sampling
Port of Portland Marine Terminal 1 South
2100 NW Front Avenue
Portland, Oregon

Project No. 5106

PAHs by EPA Method 8270 (SIM)				Analytical Results ug/l (ppb)																	
				Carcinogenic PAHs									Non-Carcinogenic PAHs								
Monitoring Well Number	Screen Interval (feet bgs)	Sample Number	Sample Date	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (ghi) perylene	Benzo (k) fluoranthene	Chrysene	Dibenzo (ah) anthracene	Indeno (1,2,3-cd) pyrene	Acenaphthene	Acenaphthylene	Anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	Total PAHs
MW-1	17 - 32	5106-011001-108	1-Oct-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND
MW-1 (Duplicate)	17 - 32	5106-011001-109	1-Oct-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND
MW-2	17 - 32	5106-011001-107	1-Oct-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	0.121	ND>0.1	ND>0.1	0.119	ND>0.1	ND>0.1	1.25	0.564	2.1
MW-3	17 - 32	5106-010928-103	28-Sep-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	0.192	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	0.138	ND>0.1	0.3
MW-4	17 - 32	5106-010928-104	28-Sep-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	0.72	ND>0.1	ND>0.1	ND>0.1	ND>0.1	0.291	0.576	0.123	1.7
MW-5	19 - 34	5106-010928-102	28-Sep-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	0.448	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	1.16	0.172	1.8
MW-6	17 - 32	5106-010928-105	28-Sep-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND
MW-7	17 - 32	5106-011001-106	1-Oct-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	0.153	0.153	0.3
EPA PRG for Tap Water -->				0.092	0.0092	0.092	#	0.92	9.2	0.0092	0.092	370.	#	1,800.	1,500.	240.	6.2	#	180.	#
DEQ Ecological Level II Screening Benchmark Value-->				0.027	0.014	#	#	#	#	#	#	520	#	#	6.16	3.9	620.	6.3	#	#

Note: # = Reference level not established
bgs = below ground surface
EPA = U.S. Environmental Protection Agency
ND = not detected above detection limit indicated
DEQ = Oregon Department of Environmental Quality
PAHs = polynuclear aromatic hydrocarbons
ppb = parts per billion
PRG = EPA Region 9 Preliminary Remediation Goal (11/00)
ug/l = micrograms per liter

Bold = Concentration in excess of EPA PRG for tap water
Shaded = Concentration in excess of Ecological Benchmark Screening Value

TABLE 6 - Summary of Analytical Results for Groundwater Samples: Monitoring Wells Versus Push Probes
Monitoring Well Installation and Groundwater Sampling
Port of Portland Marine Terminal 1 South
2100 NW Front Avenue
Portland, Oregon

Project No. 5106

Boring Number	Screen Interval (feet bgs)	Sample Number	Sample Date	Analytical Results ug/l (ppb)									
				EPA Method 8260B					EPA Method 8270		Dissolved (filtered) Metals by EPA Method 6000/7000 Series		
				Benzene	Toluene	Ethylbenzene	Total Xylenes	Other VOCs	Total PAHs (Table 5)	DEHP	Arsenic	Copper	Lead
MW-1	17 - 32	5106-011001-108	1-Oct-01	ND>1	ND>1	ND>1	ND>2	PCE = 2.76	ND	ND>10	ND>1	2.29	1.37
MW-1 (duplicate)	17 - 32	5106-011001-109	1-Oct-01	ND>1	ND>1	ND>1	ND>2	PCE = 3.29	ND	ND>10	ND>1	2.03	ND>1
B-38 (GW-3)	23 - 27	4876-000301-105	1-Mar-00	ND>1	ND>1	ND>1	ND>2	ND	8.7	-	2.3	5.1	2.2
B-39	26 - 30	4876-000313-010	13-Mar-00	-	-	-	-	-	ND	44.	-	-	-
MW-2	17 - 32	5106-011001-107	1-Oct-01	-	-	-	-	-	2.1	ND>10	14.5	ND>2	ND>1
B-77	24 - 28	5106-000922-103	22-Sep-00	ND>1	ND>1	ND>1	ND>2	ND	6.	ND>10	ND>1	1.07	ND>1
MW-3	17 - 32	5106-010928-103	28-Sep-01	-	-	-	-	-	0.3	-	11.	ND>2	ND>1
B-105	22 - 26	5106-001026-108	30-Oct-00	-	-	-	-	-	1.3	-	-	-	-
MW-4	17 - 32	5106-010928-104	28-Sep-01	ND>1	ND>1	ND>1	ND>1	ND	1.7	-	6.51	ND>2	ND>1
B-87	20 - 24	5106-001025-103	25-Oct-00	ND>1	ND>1	ND>1	ND>2	ND	32.3	-	-	-	-
MW-6	17 - 32	5106-010928-105	28-Sep-01	-	-	-	-	-	ND	ND>10	3.65	ND>2	ND>1
GW-1	24 - 28	4876-000229-102	29-Feb-00	ND>1	ND>1	ND>1	ND>1	ND	ND	109.	3.5	ND>2	ND>1
MW-7	17 - 32	5106-011001-106	1-Oct-01	-	-	-	-	-	0.3	ND>10	ND>1	ND>2	ND>1
GW-4	24 - 28	4876-000302-107	2-Mar-00	ND>1	ND>1	ND>1	ND>1	ND	ND	38.	3.	ND>2	ND>1
EPA PRG for Tap Water -->				0.35	720.	1,300.	1,400.	-	-	4.8	0.045	1,400.	15.
DEQ Ecological Level II Screening Benchmark Value-->				130.	9.8	7.3	1.8	-	-	3.	48.	12.	3.2

Note:
bgs = below ground surface
DEHP = bis(2-ethylhexyl)phthalate
EPA = U.S. Environmental Protection Agency
ND = not detected above detection limit indicated
DEQ = Oregon Department of Environmental Quality
PAHs = polynuclear aromatic hydrocarbons
PCE = tetrachloroethene
ppb = parts per billion
PRG = EPA Region 9 Preliminary Remediation Goal (11/00)
ug/l = micrograms per liter
VOCs = volatile organic compounds

1 = EPA Primary Drinking Water Regulation action level
Bold = Concentration in excess of EPA PRG for tap water
Shaded = Concentration in excess of Ecological Benchmark Screening Value

TABLE 7 - Summary of Analytical Results for Groundwater Samples: Monitoring Wells Versus Push Probes - PAHs by EPA Method 8270

Monitoring Well Installation and Groundwater Sampling
Port of Portland Marine Terminal 1 South
2100 NW Front Avenue
Portland, Oregon

Project No. 5106

PAHs by EPA Method 8270 (SIM)				Analytical Results ug/l (ppb)																	
				Carcinogenic PAHs								Non-carcinogenic PAHs									
Monitoring Well Number	Screen Interval (feet bgs)	Sample Number	Sample Date	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (ghi) perylene	Benzo (k) fluoranthene	Chrysene	Dibenzo (ah) anthracene	Indeno (1,2,3-cd) pyrene	Acenaphthene	Acenaphthylene	Anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	Total PAHs
MW-1	17 - 32	5106-011001-108	1-Oct-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND
MW-1 (Dup)	17 - 32	5106-011001-109	1-Oct-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND
B-38 (GW-3)	23-27	4876-000301-105	1-Mar-00	0.5	0.2	0.8	0.2	ND>0.1	1.	ND>0.1	ND>0.1	0.2	ND>0.1	1.7	0.4	ND>0.1	0.7	0.9	2.1	8.7
B-39	26-30	4876-000313-010	13-Mar-00	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND
MW-2	17 - 32	5106-011001-107	1-Oct-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	0.121	ND>0.1	ND>0.1	0.119	ND>0.1	ND>0.1	1.25	0.564	2.1
B-77	24-28	5106-000922-103	22-Sep-00	0.456	0.31	0.197	0.173	0.274	0.459	ND>0.2	0.156	0.119	ND>0.1	0.319	1.26	0.201	ND>0.1	0.618	1.41	6.
MW-3	17 - 32	5106-010928-103	28-Sep-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	0.192	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	0.138	ND>0.1	0.3
B-105	22-26	5106-001025-108	30-Oct-00	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	0.84	ND>0.1	0.1	ND>0.1	ND>0.1	ND>0.1	0.34	ND>0.1	1.3
MW-4	17 - 32	5106-010928-104	28-Sep-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	0.72	ND>0.1	ND>0.1	ND>0.1	ND>0.1	0.291	0.576	0.123	1.7
B-87	20-24	5106-001025-103	25-Oct-00	2.15	2.05	1.17	1.33	1.34	2.31	ND>2.0	1.07	2.15	ND>1.0	1.48	4.54	ND>1.0	ND>1.0	6.87	5.87	32.3
MW-6	17 - 32	5106-010928-105	28-Sep-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>10
GW-1	24-28	4876-000229-102	29-Feb-00	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10
MW-7	17 - 32	5106-011001-106	1-Oct-01	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.2	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	ND>0.1	0.153	0.153	0.3
GW-4	24-28	4876-000302-107	2-Mar-00	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10	ND>10
EPA PRG for Tap Water -->				0.092	0.0092	0.092	#	0.92	9.2	0.0092	0.092	370.	#	1,800.	1,500.	240.	6.2	#	180.	#
DEQ Ecological Level II Screening Benchmark Value-->				0.027	0.014	#	#	#	#	#	#	520.	#	#	6.16	3.9	620.	6.3	#	#

Note: # = Reference level not established
bgs = below ground surface
EPA = U.S. Environmental Protection Agency
ND = not detected above detection limit indicated
DEQ = Oregon Department of Environmental Quality
PAHs = polynuclear aromatic hydrocarbons
ppb = parts per billion
PRG = EPA Region 9 Preliminary Remediation Goal (11/00)
ug/l = micrograms per liter

Bold = Concentration in excess of EPA PRG for tap water

Shaded = Concentration in excess of Ecological Benchmark Screening Value

POPT1S601498

TABLE 8 – Updated Groundwater Monitoring Plan

Monitoring Well Installation and Groundwater Sampling
Port of Portland Marine Terminal 1 South
2100 NW Front Avenue
Portland, Oregon

HAI Project No. 5106

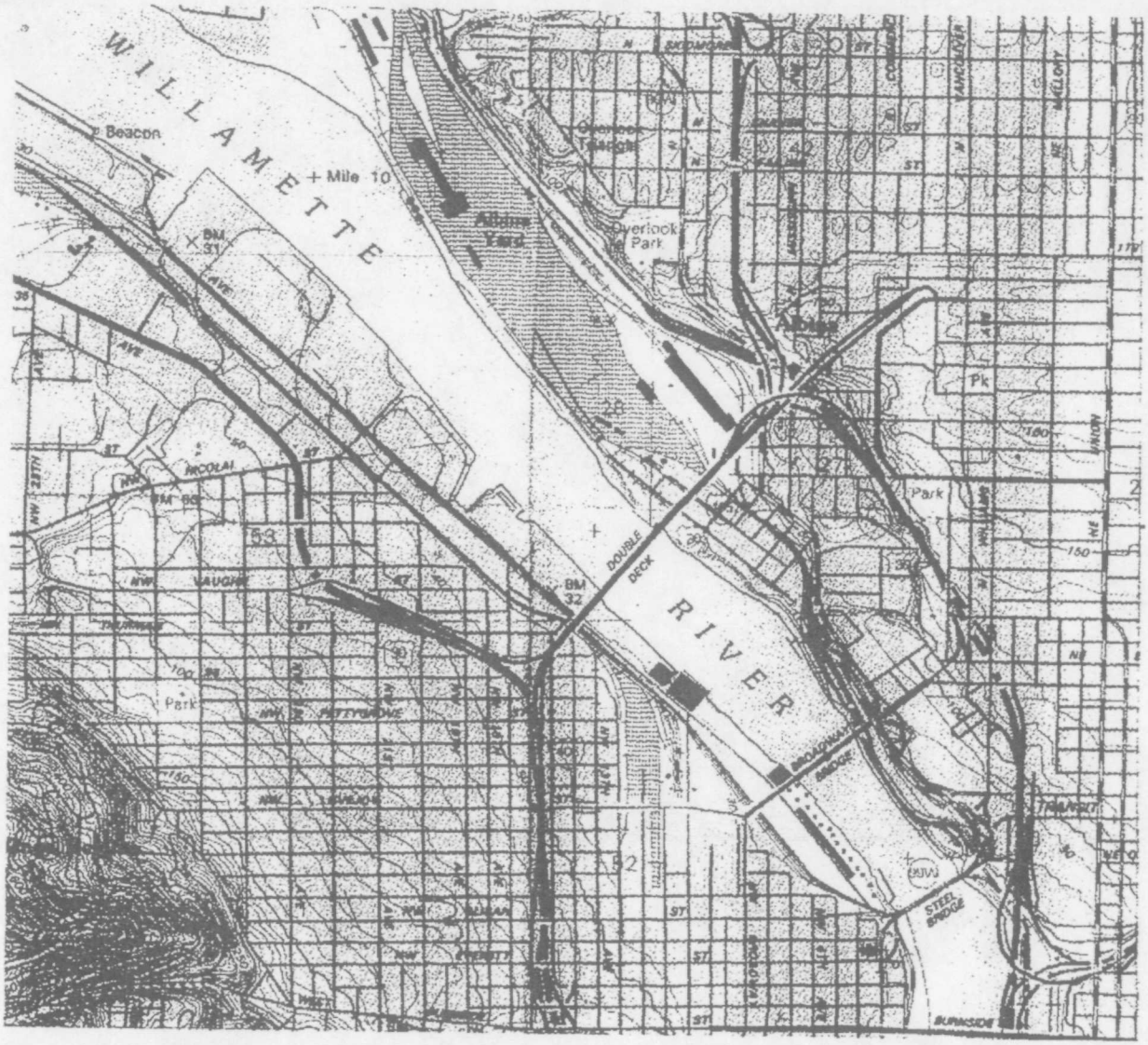
Moitoring Event ==>	September/October 2001 (completed)							January 2001 (upcoming)						
EPA Method ==>	8260B	TPH-Dx [3]	8270 SIM	8270	6010/7000		160.1	8260B	TPH-Dx [3]	8270 SIM	8270	6010/7000		160.1
Analyte ==>	VOCs	Diesel and Oil	PAHs	DEHP	Unfiltered Metals[1]	Filtered Metals[1]	TSS	VOCs	Diesel and Oil	PAHs	DEHP	Unfiltered Metals[1]	Filtered Metals[1]	TSS
MW-1	X	X	X	X	X[2]	X	X	X		X		X	X	X
MW-2			X	X	X	X	X	X		X		X	X	X
MW-3			X		X	X	X	X		X		X	X	X
MW-4	X	X	X		X[2]	X	X			X		X	X	X
MW-5			X		X	X	X			X		X	X	X
MW-6 (background)			X	X	X	X	X			X		X	X	X
MW-7			X	X	X	X	X			X		X	X	X
Duplicate	MW-1	MW-1	MW-1	MW-1	MW-1[2]	MW-1	MW-1	MW-1		MW-2		MW-2	MW-2	MW-2
Equipment Blank	X			X				X		X				
Trip Blank								X						
Total Samples ==>	4	3	8	6	8	8	8	6	0	9	0	8	8	8

NOTE:
1 = arsenic, copper, lead
2 = cadmium, chromium, mercury, nickel, silver, and zinc
3 = by Northwest Method
X = Collect and analyze for indicated analyte
DEHP = bis(2ethylhexyl)phthalate

EPA = U. S. Environmental Protection Agency
PAHs = polynuclear aromatic hydrocarbons
TPH = total petroleum hydrocarbons
TSS = total suspended solids
VOCs = volatile organic compounds

POPT1S601499

FIGURES



0 2,000 4,000

Scale in Feet

N

Note: Base Map from the Portland, Oregon USGS 7.5-Minute Quadrangle, 1990
Contour Interval: 10 Feet

HAI Project No. 5106	**HAHN AND ASSOCIATES** INCORPORATED	**Location Map**	**FIGURE**
December 2001	ENVIRONMENTAL MANAGEMENT 434 NW SIXTH AVENUE, SUITE 203 PORTLAND, OREGON 97209 503/796-0717	Monitoring Well Installation and Groundwater Sampling Port of Portland Marine Terminal 1 South 2100 NW Front Avenue Portland, Oregon	**1**

POPT1S601501

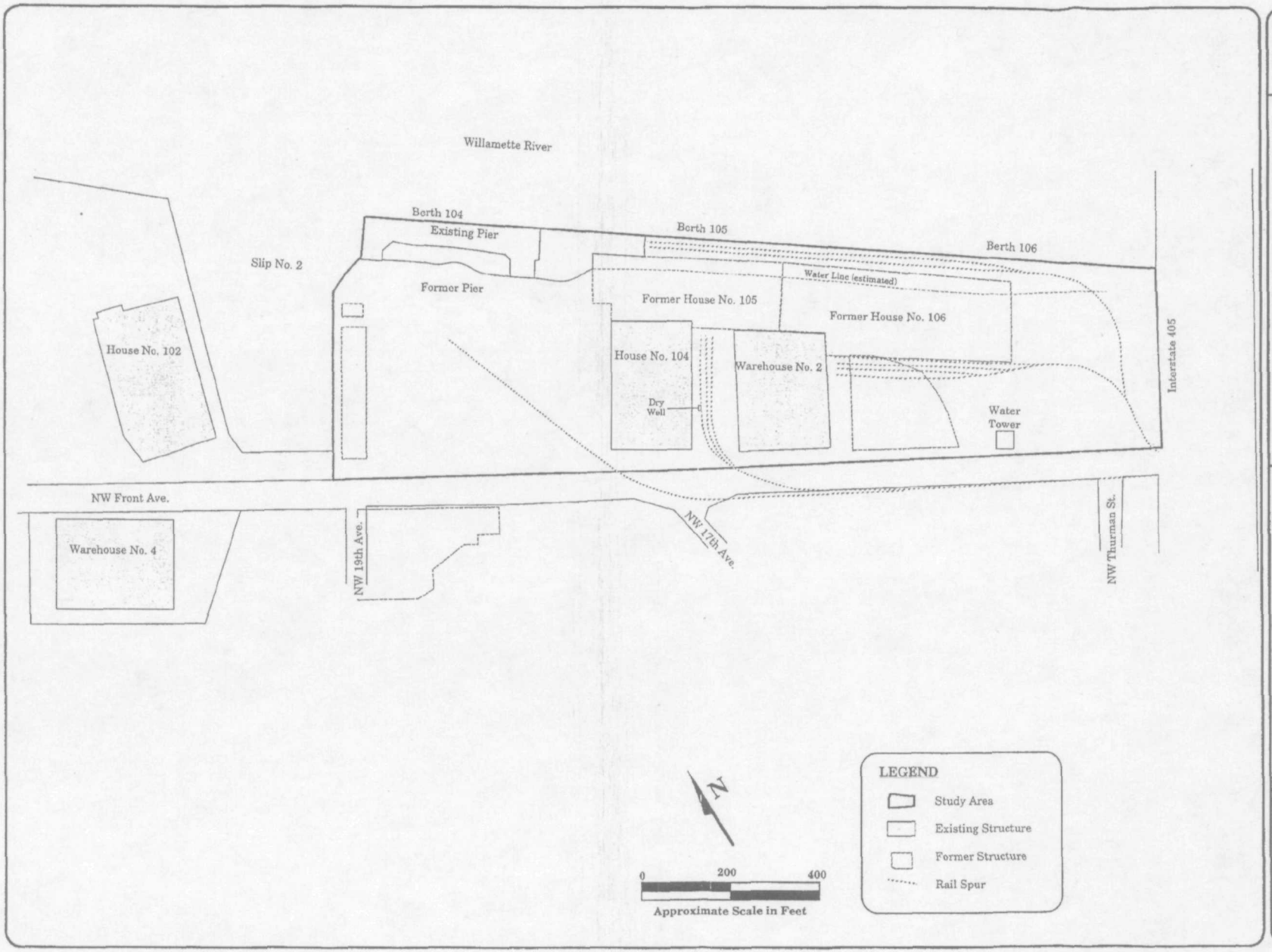


Figure 2

Site Map

Report on Monitoring Well Installation and Groundwater Monitoring
Port of Portland Marine Terminal 1
2100 NW Front Avenue
Portland, Oregon

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
(503) 796-0717

December 2001

HAI Project No. 5106

POPT1S601502

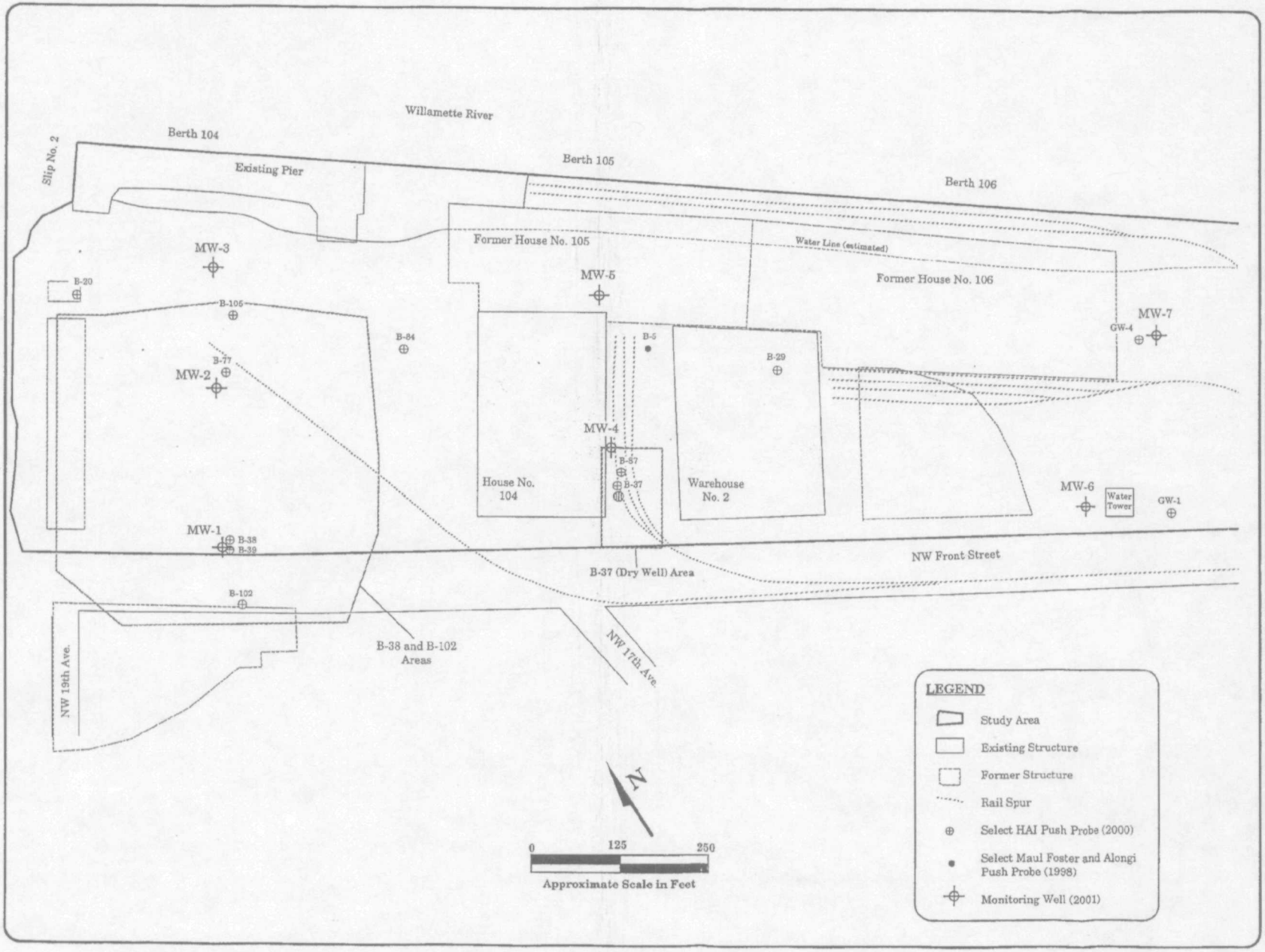


Figure 3

Monitoring Well Location Map

Report on Monitoring Well Installation and Groundwater Sampling
Port of Portland Marine Terminal 1 South
2100 NW Front Avenue
Portland, Oregon

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
(503) 796-0717

December 2001

HAI Project No. 5106

POPT1S601503

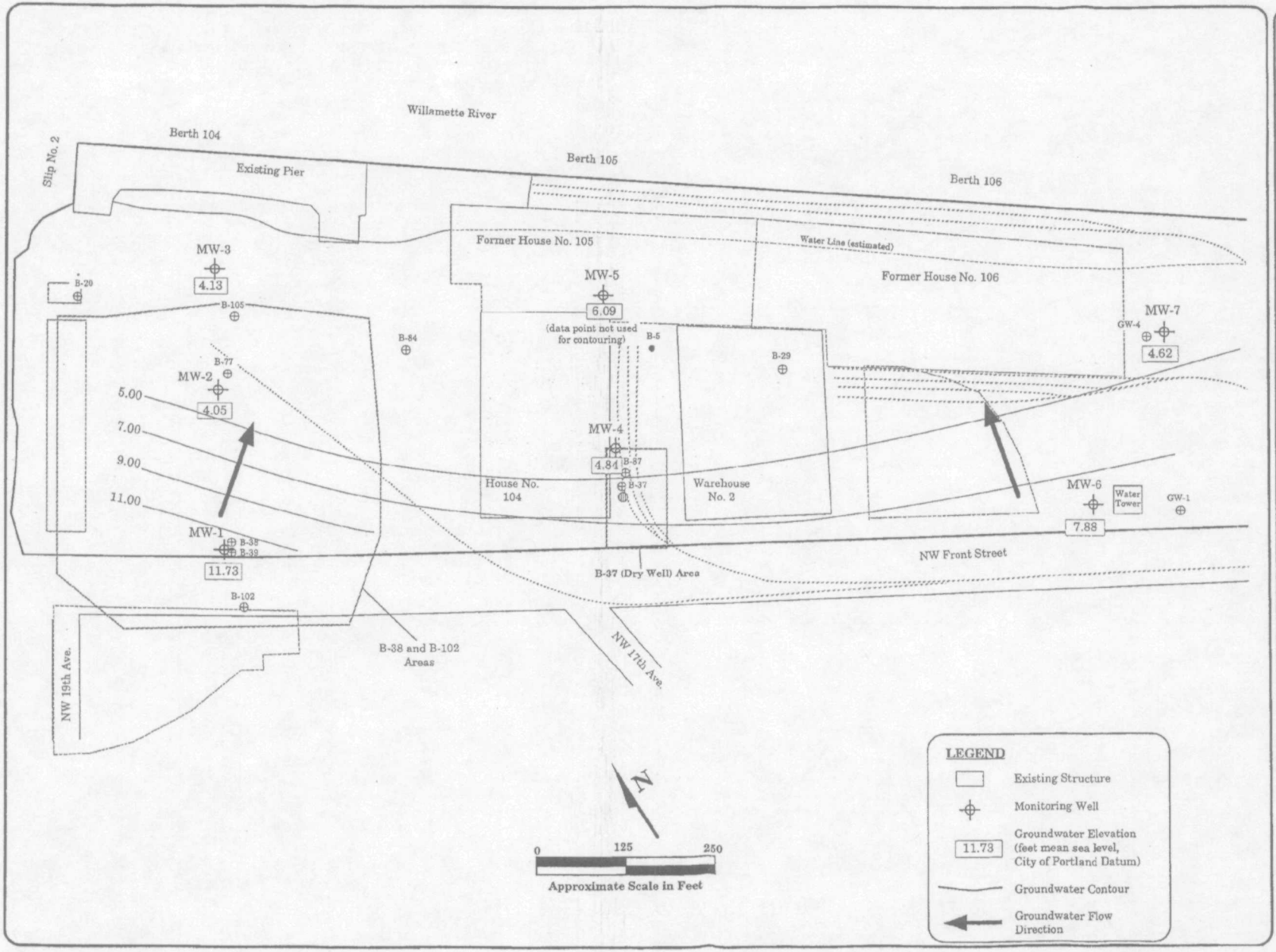


Figure 4

Groundwater Elevation Map: October 30, 2001

Report on Monitoring Well Installation and Groundwater Sampling
Port of Portland Marine Terminal 1 South
2100 NW Front Avenue
Portland, Oregon

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
(503) 796-0717

December 2001

HAI Project No. 5106

POPT1S601504

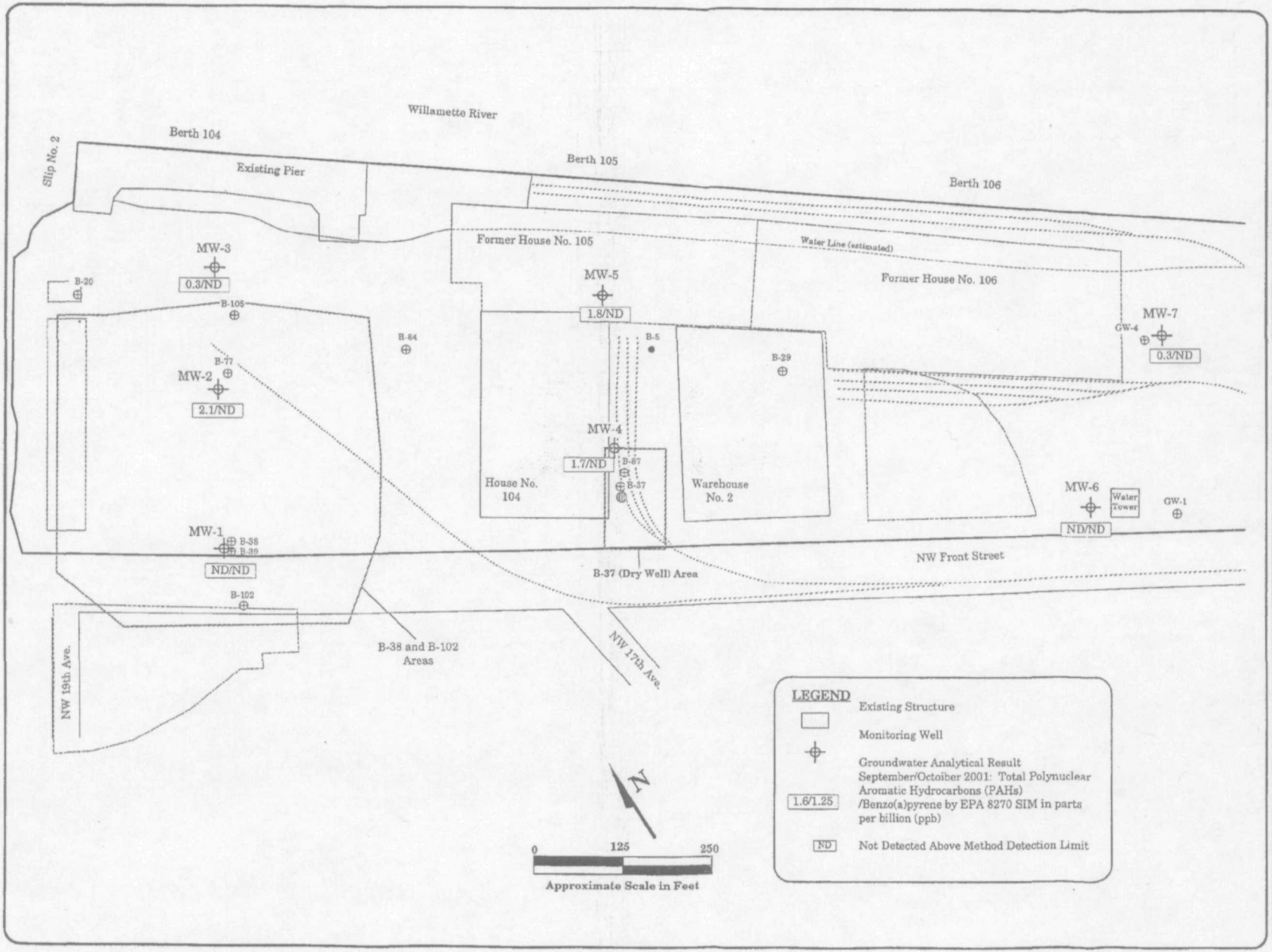


Figure 5

PAHs in Groundwater (September 23 and October 1, 2001)

Report on Monitoring Well Installation and Groundwater Sampling
Port of Portland Marine Terminal 1 South
2100 NW Front Avenue
Portland, Oregon

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
(503) 796-0717

December 2001

HAI Project No. 5106

POPT1S601505

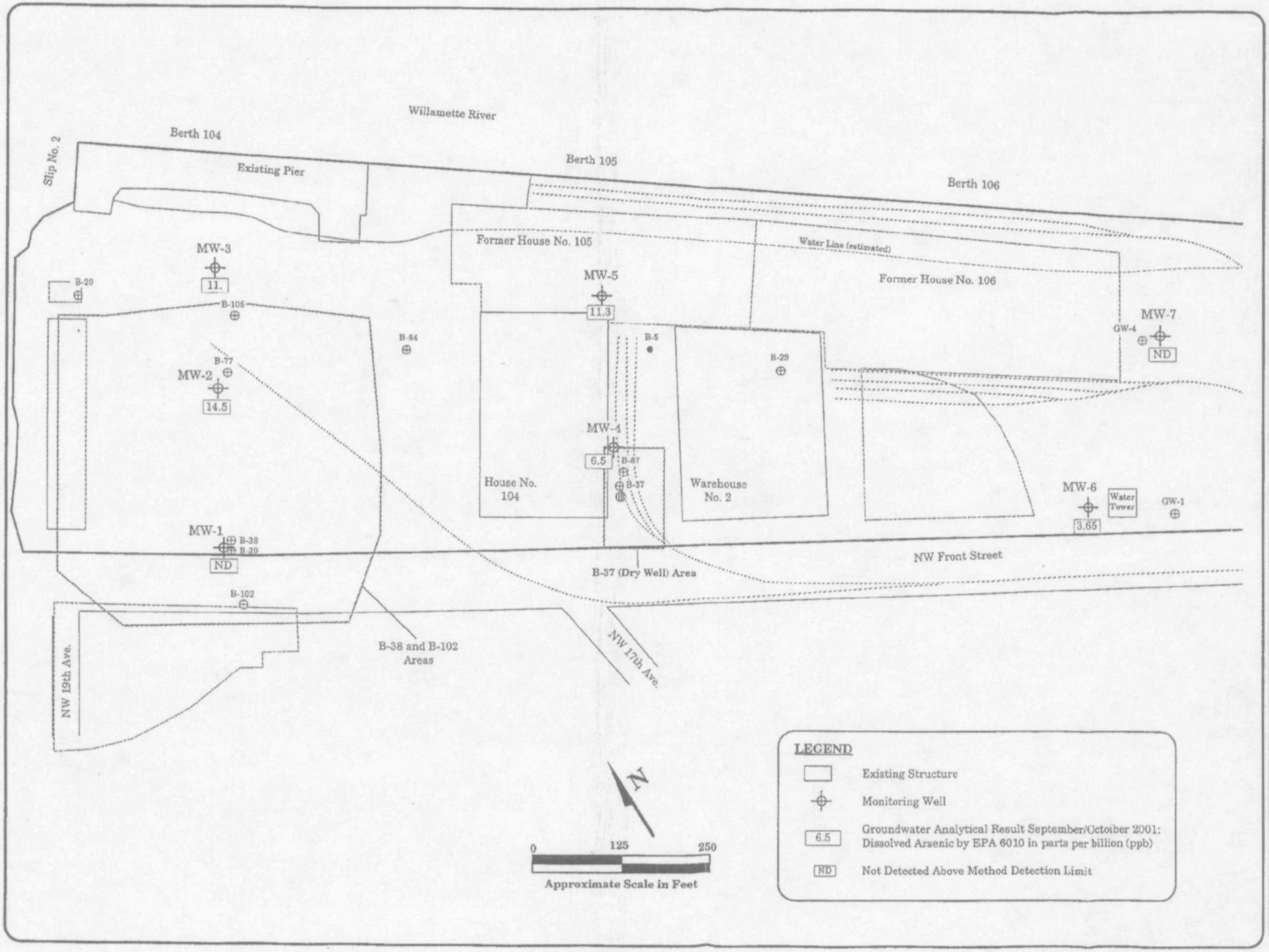


Figure 6

Dissolved Arsenic in Groundwater (September 23 and October 1, 2001

Report on Monitoring Well Installation and Groundwater Sampling
Port of Portland Marine Terminal 1 South
2100 NW Front Avenue
Portland, Oregon

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
(503) 796-0717

December 2001

HAI Project No. 5106

APPENDICES

APPENDIX A

Monitoring Well Construction Logs

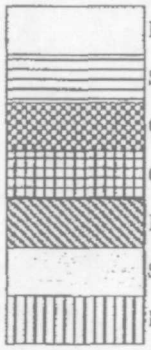
KEY TO BORING LOGS

Soil classification in this report is based upon visual and manual field observations which include moisture, consistency, plasticity and grading estimates and should not be construed to imply field or laboratory testing unless presented herein. Soils are classified in accordance with the Unified Soil Classification System. Stratigraphic boundaries are approximate representations only. No warranty is provided as to the continuity of soil strata between borings.

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COURSE GRAINED SOILS	GRAVELS More Than Half the Course Fraction is Larger Than No. 4 Sieve Size	Clean Gravels With Little or No Fines	GW	Well Graded Gravels, Gravel-Sand Mixtures
			GP	Poorly Graded Gravels, Gravel-Sand Mixtures
		Gravels With Over 12% Fines	GM	Silty Gravels, Poorly Graded Gravel-Sand-Silt Mixtures
			GC	Clayey Gravels, Poorly Graded Gravel-Sand-Clay Mixtures
More Than Half is Larger Than #200 Sieve	SANDS More Than Half the Course Fraction is Smaller Than No. 4 Sieve Size	Clean Sands With Little or No Fines	SW	Well Graded Sands, Gravelly Sands
			SP	Poorly Graded Sands, Gravelly Sands
		Sands With Over 12% Fines	SM	Silty Sands, Poorly Graded Sand-Silt Mixtures
			SC	Clayey Sands, Poorly Graded Sand-Clay Mixtures
FINE GRAINED SOILS	SILTS AND CLAYS Liquid Limit Less Than 50%		ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands, or Clayey Silts with Slight Plasticity
			CL	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
			OL	Organic Clays and Organic Silty Clays of Low Plasticity
More Than Half is Smaller Than #200 Sieve	SILTS AND CLAYS Liquid Limit Greater Than 50%		MH	Inorganic Silts, Micaceous or Diatomaceous Fine Sandy or Silty Soils, Elastic Silts
			CH	Inorganic Clays of High Plasticity, Fat Clays
			OH	Organic Clays of Medium to High Plasticity, Organic Silts
HIGHLY ORGANIC SOILS			Pt	Peat and Other Highly Organic Soils

LEGEND FOR BORING LOGS



- Blank Casing
- Slotted Screen
- Cement Grout
- Concrete
- Bentonite
- Sand Pack
- Fill Material

ABBREVIATIONS

NA	Not Applicable
ND	Not Detected Above Detection Limit
NS	Not Sampled
TPH	Total Petroleum Hydrocarbons
ppm	Parts Per Million
SPT	Standard Penetration Test
▽	Measured Static Water Level in Well
▼	Estimated Water Level During Drilling

Updated: 12/10/01
File: 5106 Boring Log Key

HAHN AND ASSOCIATES, INC.
Project No. 5106

HAHN AND ASSOCIATES, INC.	MONITORING WELL NUMBER	MW - 1
434 NW Sixth Avenue	OWRD #L51482 Start Card #135244	
Portland, Oregon 97209		
(503) 796-0717	HAI LOGGER: Matt Mudge	DRILL START: Time: 9:35 Date: 28-Aug-01
PROJECT:	SAMPLING METHOD: 2-inch OD Split Spoon	DRILL FINISH: Time: 14:05 Date: 28-Aug-01
Port of Portland Terminal 1 South	DRILLING METHOD: Hollow Stem Auger	
2100 NW Front Street	EQUIPMENT TYPE: Mobile Model B-59	
Portland, Oregon	DRILLER: Joel Welsh	
PROJECT No. 5106	DRILLING CONTRACTOR: Geo-Tech Explorations	

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	30.68 feet msl**
TOP OF CASING ELEVATION:	30.39 feet msl**

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	SPT (blows/0.5 foot)	SAMPLE RECOVERY	DEPTH (feet bgs)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Flush Monument										Asphalt - 4 inches thick
Concrete							1			
							2		GW	GRAVEL with some Sand and Concrete (fill)- brown, moist, very dense non-plastic, slightly graded, no odor, discoloration or staining
		9:45	-		14	0				
					40	0	3			CONCRETE (fill)
					50>	0			GW	
							4			CONCRETE (fill)
		9:54	-		50>	0	5		GW	
							6			
							7		SM	SAND with some Silt - brown, moist, mdium dense, non-plastic, poorly graded, no odor, discoloration or sheen
		10:02	-		4	100				
					7	100	8			CONCRETE (fill)
						0	9			
		10:07	-		50	90	10			WOOD (fill)
							11			
							12			
							13			
							14			
		11:22	-		50>	90	15			
							16			
							17	9/28/01		
							18			
							19	▽	SM	SAND with some Silt - dark grey, mosit to wet, loose, non-plastic, poorly graded, no odor, discoloration or sheen
		12:26	-		2	100	20			

2-inch ID PVC Casing; 3/4-Inch Bentonite Chips; Colorado 10/20 Sand Pack

POPT1S601510

HAHN AND ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon 97209 (503) 796-0717	**MONITORING WELL NUMBER** MW - 1 OWRD #L51482 Start Card #135244			
PROJECT: Port of Portland Terminal 1 South 2100 NW Front Street Portland, Oregon PROJECT No. 5106	HAI LOGGER:	Matt Mudge	DRILL START Time: 9:35 Date: 28-Aug-01	DRILL FINISH Time: 14:05 Date: 28-Aug-01
	SAMPLING METHOD:	2-inch OD Split Spoon		
	DRILLING METHOD:	Hollow Stem Auger		
	EQUIPMENT TYPE	Mobile Model B-59		
	DRILLER:	Joel Welsh		
	DRILLING CONTRACTOR:	Geo-Tech Explorations		

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	30.68 feet msl**
TOP OF CASING ELEVATION:	30.39 feet msl**

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	SPT (blows/0.5 foot)	SAMPLE RECOVERY	DEPTH (feet bgs)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
0.010-in Slotted PVC Screen Colorado 10/20 Sand Pack					2	100				
					2	100	21		SM	SAND with some Silt - dark grey, wet, loose, non-plastic, poorly graded, no odor, discoloration, or sheen
							22			
							23			
							24			
										SAND with some Silt - as above, no odor, discoloration, or sheen
		12:33	–		1	100	25	▼	SM	
					2	100		8/28/01		
					3	100	26		SP	SAND - brown, wet, loose, non-plastic, poorly graded, no odor, discoloration, or sheen
							27			
							28			
							29			
		12:44	–		20	100				SAND - as above, dense, no odor or discoloration, **possible sheen**
					21	100			SP	
					21	100	31			
							32			
							33			
							34			
							35			Boring terminated at 33.5 feet bgs, monitoring well constructed to 32 feet bgs
							36			Sample No. Prefix = 5106-010828-
							37			** City of Portland datum
							38			
							39			
							40			

HAHN AND ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon 97209 (503) 796-0717	**MONITORING WELL NUMBER** MW - 2 OWRD #51483 Start Card #135245			
PROJECT: Port of Portland Terminal 1 South 2100 NW Front Street Portland, Oregon PROJECT No. 5106	HAI LOGGER: Matt Mudge SAMPLING METHOD: 2-inch OD Split Spoon DRILLING METHOD: Hollow Stem Auger EQUIPMENT TYPE Mobile Model B-59 DRILLER: Joel Welsh DRILLING CONTRACTOR: Geo-Tech Explorations	DRILL START Time: 14:10 Date: 28-Aug-01	DRILL FINISH Time: 16:00 Date: 28-Aug-01	

BORING DIAMETER: 10-inch OD
CASING DIAMETER: 2-inch ID
SURFACE ELEVATION: 28.45 msl**
TOP OF CASING ELEVATION: 28.16 msl**

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	SPT (blows/0.5 foot)	SAMPLE RECOVERY	DEPTH (feet bgs)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Flush Monument / Concrete							1			Asphalt - 3 inches thick
							2		GW	GRAVEL with some Sand - brown, moist, loose, non-plastic, slightly graded, no odor, discoloration, or sheen
		14:18	–		6	100			SP	SAND - brown, moist, loose, non-plastic, poorly graded, no odor, discoloration, or sheen
					4	100	3			
					0	50				
							4			
		14:23	–		1	100	5		SP	SAND - as above, very loose, no odor, discoloration, or sheen
					0	100				
					0	40	6			
							7			
		14:26	–		1	100			SP	SAND - as above, no odor, discoloration, or sheen
					0	100	8			
					0	80				
							9			
		14:29	–		1	100	10			SAND - as above, no odor, discoloration, or sheen
					2	100			SP	
					1	80	11			
							12			
							13			
							14			
		14:32	–		2	100	15		SP	SAND - as above, no odor, discoloration or sheen
					2	100				
					2	100	16		SM	SAND with some Silt - brown, moist, very loose, non-plastic, poorly graded, no odor, discoloration, or sheen
							17			
							18			
							19			
		14:38	–		14	100	20		SP	SAND - dark gray, moist, loose, non-plastic, poorly graded, no odor, discoloration, or sheen

3/4-inch Bentonite Chips
2-inch ID PVC Casing
Colorado 10/20 Sand Pack

HAHN AND ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon 97209 (503) 796-0717	**MONITORING WELL NUMBER** MW - 2 OWRD #51483 Start Card #135245			
PROJECT: Port of Portland Terminal 1 South 2100 NW Front Street Portland, Oregon PROJECT No. 5106	HAI LOGGER:	Matt Mudge	DRILL START Time: 14:10 Date: 28-Aug-01	DRILL FINISH Time: 16:00 Date: 28-Aug-01
	SAMPLING METHOD:	2-inch OD Split Spoon		
	DRILLING METHOD:	Hollow Stem Auger		
	EQUIPMENT TYPE	Mobile Model B-59		
	DRILLER:	Joel Welsh		
	DRILLING CONTRACTOR:	Geo-Tech Explorations		

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	28.45 msl**
TOP OF CASING ELEVATION:	28.16 msl**

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	SPT (blows/0.5 foot)	SAMPLE RECOVERY	DEPTH (feet bgs)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					21	100				
					24	10	21	▼ 8/28/01	SP	SAND - dark gray, moist to wet, dense, non-plastic, poorly graded, no odor, discoloration, or sheen
							22			
							23			
							24	▽		
		14:43	–		8	100	25	9/28/01		
					14	100			SP	SAND - as above, wet, no odor, discoloration or sheen
					26	100	26			
							27			
							28			
							29			
		14:48	–		2	100	30		SP	SAND - as above, wet, lose, no odor, discoloration or sheen
					3	100				
					6	100	31		SM	SAND with some Silt - dark grey, wet, loose, non-plastic, poorly graded, no odor, discoloration, or sheen
							32			
							33			
							34			
							35			Boring terminated at 33 feet bgs, monitoring well constructed to 32 feet bgs
							36			Sample No. Prefix = 5106-010828-
							37			** City of Portland datum
							38			
							39			
							40			

0.010-in Slotted PVC Screen

Colorado 10/20 Sand Pack

HAHN AND ASSOCIATES, INC.	MONITORING WELL NUMBER	MW - 3
434 NW Sixth Avenue	OWRD#L51484 Start Card #135246	
Portland, Oregon 97209		
(503) 796-0717	HAI LOGGER: Matt Mudge	DRILL START: Time: 16:05 Date: 28-Aug-01
PROJECT:	SAMPLING METHOD: 2-inch OD Split Spoon	DRILL FINISH: Time: 17:42 Date: 28-Aug-01
Port of Portland Terminal 1 South	DRILLING METHOD: Hollow Stem Auger	
2100 NW Front Street	EQUIPMENT TYPE: Mobile Model B-59	
Portland, Oregon	DRILLER: Joel Welsh	
PROJECT No. 5106	DRILLING CONTRACTOR: Geo-Tech Explorations	

BORING DIAMETER: 10-inch OD
CASING DIAMETER: 2-inch ID
SURFACE ELEVATION: 27.97 feet msl**
TOP OF CASING ELEVATION: 27.56 feet msl**

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	SPT (blows/0.5 foot)	SAMPLE RECOVERY	DEPTH (feet bgs)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Flush Monument										Asphalt - 4 inches thick
Concrete							1		GW	GRAVEL with some Sand - brown, moist, loose, non-plastic, slightly graded, no odor, discoloration, or sheen
							2			
	005	16:12	–	-	7	100			SP	SAND - brown, moist, medium dense, non-plastic, poorly graded, no odor, discoloration, or sheen
					16	100	3			
					7	50				
							4			
		16:18	–		2	100	5			
					5	100			SP	SAND - as above, loose, no odor, discoloration, or sheen
					5	50	6			
							7			
		16:22	–		6	100				
					8	100	8		SP	SAND - as above, medium dense, no odor, discoloration, or sheen
					9	100				
							9			
		16:31	–		2	100	10			
					2	100			SP	SAND - as above, loose, no odor, discoloration, or sheen
					3	100	11			
							12			
							13			
							14			
		16:36	–		5	100	15		SP	SAND - as above, medium dense, no odor, discoloration, or sheen
					10	100				
					14	100	16			WOOD (fill)
							17			
							18			
							19		SP	SAND - dark gray, moist, loose, non-plastic, poorly graded, no odor, discoloration, or sheen
		16:45	–		8	100	20			

2-Inch ID PVC Casing
3/4-Inch Bentonite Chips
Colorado 10/20 Sand Pack

HAHN AND ASSOCIATES, INC.	MONITORING WELL NUMBER	MW - 3
434 NW Sixth Avenue	OWRD#L51484 Start Card #135246	
Portland, Oregon 97209		
(503) 796-0717	HAI LOGGER: Matt Mudge	DRILL START
PROJECT:	SAMPLING METHOD: 2-inch OD Split Spoon	DRILL FINISH
Port of Portland Terminal 1 South	DRILLING METHOD: Hollow Stem Auger	Time: 16:05 / Time: 17:42
2100 NW Front Street	EQUIPMENT TYPE Mobile Model B-59	
Portland, Oregon	DRILLER: Joel Welsh	Date: 28-Aug-01 / Date: 28-Aug-01
PROJECT No. 5106	DRILLING CONTRACTOR: Geo-Tech Explorations	

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	27.97 feet msl**
TOP OF CASING ELEVATION:	27.56 feet msl**

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	SPT (blows/0.5 foot)	SAMPLE RECOVERY	DEPTH (feet bgs)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					8	100				
					10	100	21		SP	SAND - dark gray, moist, medium dense, non-plastic, poorly graded, no odor, discoloration, or sheen
							22			
							23			
							24			
0.010-in Slotted PVC Screen		16:51	–		2	100	25	9/28/01		
Colorado 10/20 Sand Pack					3	100			SP	SAND - as above, wet, loose, no odor, discoloration, or sheen
					4	100	26			
							27	8/28/01	SM	SAND with some Silt - dark grey, wet, very loose, non-plastic, poorly graded, no odor, discoloration, or sheen
							28			
							29			
		16:56	–		2	100	30			
					3	100			SM	SAND with some Silt - as above, no odor, discoloration, or sheen
					3	10	31			
							32			
							33			
							34			Boring terminated at 33 feet bgs, monitoring well constructed to 32 feet bgs
							35			
							36			* Sample Prefix Number is 4838-010828-
							37			** City of Portland datum
							38			
							39			
							40			

POPT1S601515

HAHN AND ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon 97209 (503) 796-0717	**MONITORING WELL NUMBER** MW - 4 OWRD # L51480 Start Card #135242			
PROJECT: Port of Portland Terminal 1 South 2100 NW Front Street Portland, Oregon PROJECT No. 5106	HAI LOGGER:	Matt Mudge	DRILL START Time: 9:23 Date: 27-Aug-01	DRILL FINISH Time: 11:40 Date: 27-Aug-01
	SAMPLING METHOD:	2-inch OD Split Spoon		
	DRILLING METHOD:	Hollow Stem Auger		
	EQUIPMENT TYPE	Mobile Model B-59		
	DRILLER:	Joel Welsh		
	DRILLING CONTRACTOR:	Geo-Tech Explorations		

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	30.35 msl**
TOP OF CASING ELEVATION:	29.84 msl**

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	SPT (blows/0.5 foot)	SAMPLE RECOVERY	DEPTH (feet bgs)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Flush Monument										Asphalt - 4 inches thick
Concrete							1			WOOD (fill)
							2			
	001	9:50	–		10	100			SP	SAND with trace Silt - brown, moist, loose, poorly graded, no odor, discoloration, or sheen
					5	100	3			
					4	50				
							4			
		–	–		5	0	5			
					4	0			SP	SAND with trace Silt- as above, no odor, discoloration, or sheen
					3	0	6			
							7			
		–	–		4	100			SP	SAND with trace Silt - as above, no odor, discoloration, or sheen
					5	100	8			
					5	100				
							9			
		–	–		5	100	10		SP	SAND with trace Silt - as above, no odor, discoloration, or sheen
					4	100				
					4	100	11			
							12			
							13			
							14			
		–	–		1	100	15			
					2	100			SM	SAND with some Silt - dark grey, moist, very loose, non-plastic, slightly graded, no odor, discoloration, or sheen
					1	100	16			
							17			
							18			
							19			
		–	–		5	100	20		SM	SAND with some Silt - as above, no odor, discoloration, or sheen

2-Inch ID PVC Casing
3/4-Inch Bentonite Chips
Colorado 10/20 Sand Pack

HAHN AND ASSOCIATES, INC.	MONITORING WELL NUMBER	MW - 4
434 NW Sixth Avenue	OWRD # L51480	Start Card #135242
Portland, Oregon 97209		
(503) 796-0717	HAI LOGGER:	Matt Mudge
PROJECT:	SAMPLING METHOD:	2-inch OD Split Spoon
Port of Portland Terminal 1 South	DRILLING METHOD:	Hollow Stem Auger
2100 NW Front Street	EQUIPMENT TYPE	Mobile Model B-59
Portland, Oregon	DRILLER:	Joel Welsh
PROJECT No. 5106	DRILLING CONTRACTOR:	Geo-Tech Explorations

DRILL START	DRILL FINISH
Time: 9:23	Time: 11:40
Date: 27-Aug-01	Date: 27-Aug-01

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	30.35 msl**
TOP OF CASING ELEVATION:	29.84 msl**

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	SPT (blows/0.5 foot)	SAMPLE RECOVERY	DEPTH (feet bgs)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					6	100				
					6	100	21		SM	SAND with some Silt - dark grey, moist, medium dense, non-plastic, slightly graded, no odor, discoloration, or sheen
							22	▼ 8/27/01		
							23			
							24		SM	
0.010-in Slotted PVC Screen / Colorado 10/20 Sand Pack		–	–		3	100	25	▽		
					3	100		9/28/01	ML	SILT with some Sand - dark grey, wet, medium stiff slightly plastic, no odor, discoloration, or sheen
					3	100	26			
							27			
							28			
							29			
		–	–		2	100	30		ML	SILT with some Sand - as above, no odor, discoloration, or sheen
					3	100				
					3	10	31			
							32			
							33			Boring terminated at 32 feet bgs, monitoring well constructed to 32 feet bgs
							34			* Sample Prefix Number is 4838-010827-
							35			** City of Portland datum
							36			
							37			
							38			
							39			
							40			

HAHN AND ASSOCIATES, INC.	MONITORING WELL NUMBER	MW - 5
434 NW Sixth Avenue	OWRD 3L51486	Start Card #135248
Portland, Oregon 97209		
(503) 796-0717	HAI LOGGER:	Matt Mudge
PROJECT:	SAMPLING METHOD:	2-inch OD Split Spoon
Port of Portland Terminal 1 South	DRILLING METHOD:	Hollow Stem Auger
2100 NW Front Street	EQUIPMENT TYPE	Mobile Model B-59
Portland, Oregon	DRILLER:	Joel Welsh
PROJECT No. 5106	DRILLING CONTRACTOR:	Geo-Tech Explorations

DRILL START	DRILL FINISH
Time: 10:35	Time: 12:30
Date: 29-Aug-01	Date: 29-Aug-01

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	33.23 msl**
TOP OF CASING ELEVATION:	33.04 msl**

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	SPT (blows/0.5 foot)	SAMPLE RECOVERY	DEPTH (feet bgs)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Flush Monument / Concrete							1			Asphalt - 3 inches thick
							2		SP	SAND - brown, moist, medium dense, non-plastic, poorly graded, no odor, discoloration, or sheen
	007	11:00	–		5	100				
					6	100	3			
					9	80				
							4			
		11:05	–		7	100	5		SP	SAND - as above, loose, no odor, discoloration, or sheen
					2	100				
					5	10	6			
							7			
		11:08	–		3	100			SP	SAND - as above, no odor, discoloration, or sheen
					4	100	8			
					5	100				
							9			
		11:10	–		4	100	10		SP	SAND - as above, no odor, discoloration, or sheen
					4	100				
					4	100	11			
							12			
							13			
							14			
		11:14	–		4	100	15		SP	SAND - as above, no odor, discoloration, or sheen
					5	100				
					7	100	16			
							17			
							18			
							19			
		11:18	–		3	100	20		SP	SAND - as above, no odor, discoloration, or sheen

2-Inch ID PVC Casing; 3/4-Inch Bentonite Chips; Colorado 10/20 Sand Pack

HAHN AND ASSOCIATES, INC.	MONITORING WELL NUMBER	MW - 5		
434 NW Sixth Avenue	OWRD 3L51486	Start Card #135248		
Portland, Oregon 97209				
(503) 796-0717	HAI LOGGER:	Matt Mudge	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	2-inch OD Split Spoon		
Port of Portland Terminal 1 South	DRILLING METHOD:	Hollow Stem Auger	Time:	Time:
2100 NW Front Street	EQUIPMENT TYPE	Mobile Model B-59	10:35	12:30
Portland, Oregon	DRILLER:	Joel Welsh	Date:	Date:
PROJECT No. 5106	DRILLING CONTRACTOR:	Geo-Tech Explorations	29-Aug-01	29-Aug-01

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	33.23 msl**
TOP OF CASING ELEVATION:	33.04 msl**

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	SPT (blows/0.5 foot)	SAMPLE RECOVERY	DEPTH (feet bgs)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					2	100				
					5	100	21		SM	SAND with some Silt - dark grey, moist, loose, non-plastic, poorly graded, no odor, discoloration, or staining
							22			
							23			
							24	▼		
0.010-in Slotted PVC Screen / Colorado 10/20 Sand Pack		11:22	–		3	100	25	8/29/01	SM	SAND with some Silt - as above, wet, no odor, discoloration, or sheen
					3	100				
					4	100	26			
							27	▽		
							28	9/28/01		
							29			
		11:26	–		1	100	30		SM	SAND with some Silt - as above, very loose, no odor, discoloration, or sheen
					2	100				
					1	100	31			
							32			
							33			
							34			
							35			
							36			Boring terminated at 34.5 feet bgs, monitoring well constructed to 34 feet bgs
							37			* Sample Prefix Number is 4838-010829-
							38			** City of Portland datum
							39			
							40			

HAHN AND ASSOCIATES, INC.	MONITORING WELL NUMBER	MW - 6	
434 NW Sixth Avenue	OWRD #L51481	Start Card #135243	
Portland, Oregon 97209			
(503) 796-0717	HAI LOGGER:	Matt Mudge	DRILL START / DRILL FINISH
PROJECT:	SAMPLING METHOD:	2-inch OD Split Spoon	
Port of Portland Terminal 1 South	DRILLING METHOD:	Hollow Stem Auger	Time: 7:32 / Time: 9:15
2100 NW Front Street	EQUIPMENT TYPE	Mobile Model B-59	
Portland, Oregon	DRILLER:	Joel Welsh	Date: 28-Aug-01 / Date: 28-Aug-01
PROJECT No. 5106	DRILLING CONTRACTOR:	Geo-Tech Explorations	

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	30.62 feet msl**
TOP OF CASING ELEVATION:	30.25 feet msl**

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	SPT (blows/0.5 foot)	SAMPLE RECOVERY	DEPTH (feet bgs)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Flush Monument / Concrete							1			Asphalt - 4 inches thick
							2			
		7:48	–		10	0			GP	GRAVEL with some Sand - moist, medium dense, non-plastic, slightly graded, no odor, discoloration, or sheen
					11	0	3			
					15	0				
							4			
	004	7:53	–	ND	6	100	5		GP	GRAVEL with some Sand - as above, loose, no odor or discoloration, **possible sheen**
					6	100				
					6	70	6			
							7			
		7:57	–		6	100			GP	GRAVEL with some Sand - as above, loose, no odor or discoloration, **possible sheen**
					5	100	8			
					5	100				
							9			
					4	100	10		GP	GRAVEL with some Sand - as above, loose, no odor or discoloration, **possible sheen**
					5	100				
					4	100	11			
							12			
							13			
							14			
		8:03	–		4	100	15		GP	GRAVEL with some Sand - as above, loose, no odor, discoloration, or sheen
					3	100				
					6	100	16			
							17			
							18			
							19			
		8:07	–		2	100	20		GP	GRAVEL with some Sand - as above, loose, no odor, discoloration, or sheen

2-Inch ID PVC Casing; 3/4-Inch Bentonite Chips; Colorado 10/20 Sand Pack

HAHN AND ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon 97209 (503) 796-0717	**MONITORING WELL NUMBER** MW - 6 OWRD #L51481 Start Card #135243		DRILL START	DRILL FINISH
PROJECT: Port of Portland Terminal 1 South 2100 NW Front Street Portland, Oregon	HAI LOGGER:	Matt Mudge	Time:	Time:
	SAMPLING METHOD:	2-inch OD Split Spoon	7:32	9:15
	DRILLING METHOD:	Hollow Stem Auger		
	EQUIPMENT TYPE	Mobile Model B-59		
	DRILLER:	Joel Welsh	Date:	Date:
PROJECT No. 5106	DRILLING CONTRACTOR:	Geo-Tech Explorations	28-Aug-01	28-Aug-01

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	SPT (blows/0.5 foot)	SAMPLE RECOVERY	DEPTH (feet bgs)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					3	100				SAND with some Silt - dark grey, moist to wet, loose, non-plastic, slightly graded, no odor, discoloration, or sheen
					3	100	21	8/28/01		
							22		SM	
							23	9/28/01		
							24			
0.010-in Slotted PVC Screen / Colorado 10/20 Sand Pack		8:12	–		1	100	25		SM	SAND with some Silt - as above, wet, no odor, discoloration, or sheen
					2	100				
					4	100	26			
							27			
							28			
							29			
		8:16	–		3	100	30			
					4	100			SM	SAND with some Silt - as above, no odor, discoloration, or sheen
					5	100	31			
							32			
							33			
							34			
							35			Boring terminated at 32 feet bgs, monitoring well installed to 32 feet bgs
							36			* Sample Prefix Number is 4838-010828-
							37			** City of Portland datum
							38			
							39			
							40			

BORING DIAMETER: 10-inch OD
CASING DIAMETER: 2-inch ID
SURFACE ELEVATION: 30.62 feet msl**
TOP OF CASING ELEVATION: 30.25 feet msl**

HAHN AND ASSOCIATES, INC.	MONITORING WELL NUMBER	MW - 7
434 NW Sixth Avenue	OWRD #L51485	Start Card #135247
Portland, Oregon 97209		
(503) 796-0717	HAI LOGGER: Matt Mudge	DRILL START: Time: 8:45 / Date: 29-Aug-01
PROJECT:	SAMPLING METHOD: 2-inch OD Split Spoon	DRILL FINISH: Time: 10:30 / Date: 29-Aug-01
Port of Portland Terminal 1 South	DRILLING METHOD: Hollow Stem Auger	
2100 NW Front Street	EQUIPMENT TYPE: Mobile Model B-59	
Portland, Oregon	DRILLER: Joel Welsh	
PROJECT No. 5106	DRILLING CONTRACTOR: Geo-Tech Explorations	

BORING DIAMETER: 10-inch OD; 4-inch ID
CASING DIAMETER: 2-inch ID
SURFACE ELEVATION: 33.76 feet msl**
TOP OF CASING ELEVATION: 33.51 feet msl**

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	SPT (blows/0.5 foot)	SAMPLE RECOVERY	DEPTH (feet bgs)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Flush Monument / Concrete							1			Asphalt - 4 inches thick
							2		SP	SAND - brown, moist, medium dense, non-plastic, poorly graded, no odor, discoloration, or sheen
	006	8:57	–		8	100				
					7	100	3			
					8	100				
							4			
		9:02	–		3	0	5		SP	SAND - as above, loose, no odor, discoloration, or sheen
					7	0				
					3	0	6			
3/4-Inch Bentonite Chips							7			
		9:06	–		2	100			SP	SAND - as above, very loose, no odor, discoloration, or sheen
					2	100	8			
					2	100				
							9			
		9:09	–		1	100	10		SP	SAND - as above, no odor, discoloration, or sheen
					1	100				
					1	100	11			
							12			
							13			
							14			
		9:11	–		2	100	15		SP	SAND - as above, no odor, discoloration, or sheen
					1	100				
					1	100	16			
							17			
							18			
							19			
Colorado 10/20 Sand Pack		9:15	–		2	100	20		SP	SAND - as above, no odor, discoloration, or sheen

2-Inch ID PVC Casing

HAHN AND ASSOCIATES, INC.	MONITORING WELL NUMBER	MW - 7		
434 NW Sixth Avenue	OWRD #L51485	Start Card #135247		
Portland, Oregon 97209				
(503) 796-0717	HAI LOGGER:	Matt Mudge	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	2-inch OD Split Spoon		
Port of Portland Terminal 1 South	DRILLING METHOD:	Hollow Stem Auger	Time:	Time:
2100 NW Front Street	EQUIPMENT TYPE	Mobile Model B-59	8:45	10:30
Portland, Oregon	DRILLER:	Joel Welsh	Date:	Date:
PROJECT No. 5106	DRILLING CONTRACTOR:	Geo-Tech Explorations	29-Aug-01	29-Aug-01

BORING DIAMETER:	10-inch OD; 4-inch ID
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	33.76 feet msl**
TOP OF CASING ELEVATION:	33.51 feet msl**

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	SPT (blows/0.5 foot)	SAMPLE RECOVERY	DEPTH (feet bgs)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					3	100			SP	SAND - brown, moist, looose, non-plastic, poorly graded, no odor, discoloration, or sheen
					5	100	21			
							22			
							23			
							24			CONCRETE (fill)
		9:19	–		1	100	25		ML	SILT with some Sand - dark grey, moist, soft, non-plastic, no odor, discoloration, or sheen
					2	100				
					2	100	26			
							27	▼ 8/29/01		
							28			
							29	▽		
		9:25	–		3	100	30	9/28/01	GP	GRAVEL with some Sand - dark grey, saturated, medium dense, non-plastic, poorly graded, no odor, discoloration, or sheen
					7	100				
					19	50	31			
							32			WOOD
							33			
							34			Boring terminated at 33 feet bgs, monitoring well constructed to 32 feet bgs
							35			* Sample Prefix Number is 4838-010829-
							36			** City of Portland datum
							37			
							38			
							39			
							40			

0.010-in Slotted PVC Screen
Colorado 10/20 Sand Pack

APPENDIX B

Monitoring Well Sampling Summary Sheets

Water Elevation Collection Summary Log

HAI Project Number: 5106

HAI Project Acronym: TONDVL

Sampler: ~~Jill Betts~~, Derek Sandoz

Date 30-Oct-01

Location	Time	Static Water Level (feet btoc)
MW-1	10:50	18.64
	11:45	18.66
MW-2	10:42	24.11
	11:39	24.11
MW-3	10:36	23.45
	11:31	23.43
MW-4	10:14	24.90
	11:14	25.00

Location	Time	Static Water Level (feet btoc)
MW-5	10:24	26.9
	11:20	26.95
MW-6	9:54	~~22.33~~ 23.83 DCS
	10:55	22.37
MW-7	10:04	28.90
	11:06	28.89

Water Elevation Collection Summary Log

HAI Project Number: 5106

HAI Project Acronym: TONDVL

Sampler: ~~Jill Betts, Derek Sandos~~ Matt Mudge

Date 9/28/01

Location	Time	Static Water Level (feet btoc)
MW-1	8:21	18 52
	8:56	18 53
MW-2	8:17	23 97
	8:52	23 97
MW-3	8:13	23 45
	8:48	23 46
MW-4	8:26	24 84
	9:01	24 91
	9:11	24 93

Location	Time	Static Water Level (feet btoc)
MW-5	8:07	26 93
	8:45	26 96
MW-6	8:31	22 39
	9:04	22 41
MW-7	8:35	29 16
	9:07	29 22
	9:22	29 25

Monitoring Well Sampling Summary Sheet

WELL NUMBER: 1

General Information	
Project Name: Marine Terminal 1 South	
HAI Project Number: 5106	
Date:	10/01/01
Sampling Personnel:	Matt Mudge
Purge Method:	stainless submersible
Sampling Method:	stainless submersible + disposable bailer

Sample Information	
Sample Date:	10/01/01
Sample Time:	12:18 & 12:20
Sample Number: 5106-	~~D100~~ 011001 - 108 & 109

plus duplicate →

Purge Volume Calculation					
Total Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	One Well Vol (gal)	Three Well Volumes (gal)
32.0	18.53	13.47	0.17	2.29	6.87

2' well = 0.17 gallons/linear ft   4" well = 0.66 gallons/linear ft

Sample Containers			
Number	Type	Preservative	Analytical Parameters
3	40ml VOA	HCL	✓ VOCs by EPA 8260B
1	1 l Amber	none	✓ TPH as diesel and oil by NW TPH-Dx
1	1 l Amber	none	✓ PAHs by EPA 8270 SIM
1	1 l Amber	none	✓ DEHP by EPA 8270
1	250 ml plastic	none	✓ TSS by EPA 160.1
1	250 ml plastic	nitric	✓ filtered metals by EPA 6010
1	250 ml plastic	nitric	✓ unfiltered metals by EPA 6010

Well Purge Data **Total Volume to Purge =** 7

Time	Volume Purged (gallons)	Conductivity (uS/cm) x100 / x1000	Temperature degrees (C / F)	pH	Turbidity (NTU)	Dissolved Oxygen	Redox Potential	Comments
12:06	0	123.2	17.2	6.48	32.1	1.46	-261	slightly turbid, No odor
12:09	2.5	114.9	17.4	6.56	126.1	1.87	-177	slightly turbid, No odor
12:13	5	112.9	17.6	6.60	138.2	1.63	-104	slightly turbid, No odor
12:17	7	111.8	17.1	6.64	124.0	1.66	-105	slightly turbid, No odor
								* purge bucket
								has sheen on water!

Purge Water Disposition
Drum No. 36

Monitoring Well Sampling Summary Sheet

WELL NUMBER: 2

General Information	
Project Name: Marine Terminal 1 South	
HAI Project Number: 5106	
Date:	10/9/01
Sampling Personnel:	Matt Mudge
Purge Method:	stainless submersible
Sampling Method:	stainless submersible

Sample Information	
Sample Date:	10/01/01
Sample Time:	10:38
Sample Number: 5106-~~0109~~ MSM	011001-107

Purge Volume Calculation

Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	One Well Vol (gal)	Three Well Volumes (gal)
32	23.97	8.03	0.17	1.37	4.07

2' well = 0.17 gallons/linear ft 4" well = 0.66 gallons/linear ft

Sample Containers

Number	Type	Preservative	Analytical Parameters
	40ml VOA	HCL	VOCs by EPA 8260B
	1 l Amber	none	TPH as diesel and oil by NW TPH-Dx
1	1 l Amber	none	✓ PAHs by EPA 8270 SIM
1	1 l Amber	none	✓ DEHP by EPA 8270
1	250 ml plastic	none	✓ TSS by EPA 160.1
1	250 ml plastic	nitric	✓ filtered metals by EPA 6010
1	250 ml plastic	nitric	✓ unfiltered metals by EPA 6010

Well Purge Data — **Total Volume to Purge = 4.5**

Time	Volume Purged (gallons)	Conductivity (uS/cm) x100 / x1000	Temperature degrees (C/F)	pH	Turbidity (NTU)	Dissolved Oxygen	Redox Potential	Comments
10:07	0	162.7	16.3	6.32	>200	1.21	-022	turbid, dark grey, no odor
10:11	1.5	146.1	16.3	6.38	60.9	1.58	-028	slightly turbid, no odor
10:13	3.25	144.2	16.4	6.38	27.2	0.96	-043	slightly turbid, no odor
10:16	4.2	142.0	16.4	6.42	15.59	0.99	-052	slightly turbid, no odor
10:34	6	133.3	16.1	6.42	20.50	0.97	-072	slightly turbid, no odor
								# purge bucket has
								sheen on water!

Purge Water Disposition

Drum No. 35

Monitoring Well Sampling Summary Sheet

WELL NUMBER: 3

General Information	
Project Name: Marine Terminal 1 South	
HAI Project Number: 5106	
Date:	9/28/01
Sampling Personnel:	Matt Mudge
Purge Method:	Stainless submersible
Sampling Method:	" "

Sample Information	
Sample Date:	9/28/01
Sample Time:	13:12
Sample Number: 5106-0109	78 - 103

Purge Volume Calculation

Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	One Well Vol (gal)	Three Well Volumes (gal)
32	23.46	8.54	0.17	1.45	4.36

2' well = 0.17 gallons/linear ft 4" well = 0.66 gallons/linear ft

Sample Containers

Number	Type	Preservative	Analytical Parameters
	40ml VOA	HCL	VOCs by EPA 8260B
	1 l Amber	none	TPH as diesel and oil by NW TPH-Dx
1	1 l Amber	none	✓ PAHs by EPA 8270 SIM
	1 l Amber	none	DEHP by EPA 8270
1	250 ml plastic	none	✓ TSS by EPA 160.1
1	250 ml plastic	nitric	✓ filtered metals by EPA 6010
1	250 ml plastic	nitric	✓ unfiltered metals by EPA 6010

Well Purge Data — Total Volume to Purge = 4.5

Time	Volume Purged (gallons)	Conductivity (uS/cm) x100 / x1000	Temperature degrees (C/F)	pH	Turbidity (NTU)	Dissolved Oxygen	Redox Potential	Comments
12:48	0	139.6	17.4	5.85	>200	1.60	092	slightly turbid, No odor
12:51	1.5	139.0	17.3	6.15	81.7	5.31	046	" " "
12:54	3	157.5	19.2	6.19	113.7	2.45	-009	" " " "
12:58	4.5	147.2	17.3	6.22	127.4	2.52	-017	" " " "
13:02	6	155	18.2	6.19	143.1	3.53	-021	" " " "
	~~6~~ rsm	~~B~~						purged dry
13:07	10	150.9	17.9	6.30	191.2	2.27	-028	slightly turbid, No odor

Purge Water Disposition

Drum No. 35

Monitoring Well Sampling Summary Sheet

WELL NUMBER: 4

General Information	
Project Name: Marine Terminal 1 South	
HAI Project Number: 5106	
Date: 9/28/01	
Sampling Personnel: Matt Mudge / Dean Smith	
Purge Method: Stainless Submersible	
Sampling Method: " + Bailer (disposable)	

Purge Volume Calculation					
Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	One Well Vol (gal)	Three Well Volumes (gal)
32	24.93	7.07	0.17	1.20	3.6

2" well = 0.17 gallons/linear ft 4" well = 0.66 gallons/linear ft

Sample Information	
Sample Date:	9/28/01
Sample Time:	14:25
Sample Number: 5106-010928-104	

Sample Containers			
Number	Type	Preservative	Analytical Parameters
3	40ml VOA	HCL	✓ VOCs by EPA 8260B
1	1 l Amber	none	✓ TPH as diesel and oil by NW TPH-Dx
1	1 l Amber	none	✓ PAHs by EPA 8270 SIM
	1 l Amber	none	DEHP by EPA 8270
1	250 ml plastic	none	✓ TSS by EPA 160.1
1	250 ml plastic	nitric	✓ filtered metals by EPA 6010
1	250 ml plastic	nitric	✓ unfiltered metals by EPA 6010

Well Purge Data — **Total Volume to Purge = 3.6 +**

Time	Volume Purged (gallons)	Conductivity (uS/cm) x100 / x1000	Temperature degrees (C/F)	pH	Turbidity (NTU)	Dissolved Oxygen	Redox Potential	Comments
~~14:10~~	0	78.5	17.4	6.53	200+	2.37	042	TURBID/NO ODOR
14:14	1.20	82.4	17.1	6.54	200+	3.20	028	TURBID/NO ODOR
14:16	2.40	82.5	18.6	6.59	200+	1.70	011	" "
14:18	3.60	80.7	18.9	6.62	115	1.74	012	slightly turbid

Purge Water Disposition → Drum
Drum No. 35

Monitoring Well Sampling Summary Sheet

WELL NUMBER: 5

General Information	
Project Name:	Marine Terminal 1 South
HAI Project Number:	5106
Date:	9/28/01
Sampling Personnel:	Matt Mudge
Purge Method:	Grundfos submersible
Sampling Method:	" "

Purge Volume Calculation

Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	One Well Vol (gal)	Three Well Volumes (gal)
34	26.96	7.04	0.17	1.20	3.59

2' well = 0.17 gallons/linear ft 4" well = 0.66 gallons/linear ft

Sample Information	
Sample Date:	9/28/01
Sample Time:	11:24
Sample Number:	5106-0109 28 - 102

Sample Containers

Number	Type	Preservative	Analytical Parameters
	40ml VOA	HCL	VOCs by EPA 8260B
	1 l Amber	none	TPH as diesel and oil by NW TPH-Dx
1	1 l Amber	none	PAHs by EPA 8270 SIM
	1 l Amber	none	DEHP by EPA 8270
1	250 ml plastic	none	TSS by EPA 160.1
1	250 ml plastic	nitric	filtered metals by EPA 6010
1	250 ml plastic	nitric	unfiltered metals by EPA 6010

Well Purge Data — **Total Volume to Purge = 4**

Time	Volume Purged (gallons)	Conductivity (uS/cm) x100 / x1000	Temperature degrees (C) F	pH	Turbidity (NTU)	Dissolved Oxygen	Redox Potential	Comments
10:57	0	281	15.4	7.79	31.8	15.1	-043	slightly turbid, no odor
11:06	1.25	156.1	16.0	6.97	~~48.4~~	37.6	-010	slightly turbid, No odor.
11:11	2.50	128.9	16.7	6.58	37.1	27.9	-052	" " " "
11:14	3.75	116.5	17.5	6.41	60.1	26.7	-051	" " " "
11:18	5	105.8	18.2	6.29	61.8	38.1	-053	" " " "
11:09								water column surface skimmed

Purge Water Disposition	
Drum No.	35

Monitoring Well Sampling Summary Sheet

WELL NUMBER: 6

General Information	
Project Name: Marine Terminal 1 South	
HAI Project Number: 5106	
Date: 9/28/01	
Sampling Personnel: Matt Mudge / Derek Sandve	
Purge Method: STAINLESS SUBMERSIBLE	
Sampling Method: "	"

Sample Information	
Sample Date:	9/28/01
Sample Time:	15:30
Sample Number: 5106-0109 28-105	

Purge Volume Calculation

Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	One Well Vol (gal)	Three Well Volumes (gal)
32.0	22.41	9.59	0.17	1.63	4.89

2" well = 0.17 gallons/linear ft 4" well = 0.66 gallons/linear ft

Sample Containers

Number	Type	Preservative	Analytical Parameters
	40ml VOA	HCL	VOCs by EPA 8260B
	1 l Amber	none	TPH as diesel and oil by NW TPH-Dx
1	1 l Amber	none ✓	PAHs by EPA 8270 SIM
1	1 l Amber	none ✓	DEHP by EPA 8270
1	250 ml plastic	none ✓	TSS by EPA 160.1
1	250 ml plastic	nitric ✓	filtered metals by EPA 6010
1	250 ml plastic	nitric ✓	unfiltered metals by EPA 6010

Well Purge Data — **Total Volume to Purge = 4.90 +**

Time	Volume Purged (gallons)	Conductivity (uS/cm) x100 / x1000	Temperature degrees (C/F)	pH	Turbidity (NTU)	Dissolved Oxygen	Redox Potential	Comments
1515	0	82.3	17.7	6.61	142	2.19	040	SLIGHTLY TURBID NO ODS
1518	1.63	76.3	17.2	6.63	76.2	1.64	-002	CLEAR NO ODS
1520	3.26	83.2	17.0	6.58	18.61	1.40	-52	CLEAR NO ODS
1523	4.89	85.9	17.2	6.58	20.7	3.10	-92	CLEAR NO ODS
1525	6.50	87.5	17.1	6.59	27.6	1.31	-021 (Ag)	" "
1527	8.10	88.3	17.0	6.60	20.7	1.36	-39	" "

Purge Water Disposition	
Drum No.	35

Monitoring Well Sampling Summary Sheet

WELL NUMBER: 7

General Information	
Project Name: Marine Terminal 1 South	
HAI Project Number: 5106	
Date:	10/1/01
Sampling Personnel:	Matt Mudge
Purge Method:	Stainless submersible
Sampling Method:	Stainless submersible

Sample Information	
Sample Date:	10/1/01
Sample Time:	9:03
Sample Number: 5106-~~1200~~ MSM	011001-106

Purge Volume Calculation

Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	One Well Vol (gal)	Three Well Volumes (gal)
32.0	29.35	2.75	0.17	0.47	1.42

2" well = 0.17 gallons/linear ft 4" well = 0.66 gallons/linear ft

Sample Containers

Number	Type	Preservative	Analytical Parameters
	40ml VOA	HCL	VOCs by EPA 8260B
	1 l Amber	none	TPH as diesel and oil by NW TPH-Dx
1	1 l Amber	none	PAHs by EPA 8270 SIM
1	1 l Amber	none	DEHP by EPA 8270
1	250 ml plastic	none	TSS by EPA 160.1
1	250 ml plastic	nitric	filtered metals by EPA 6010
1	250 ml plastic	nitric	unfiltered metals by EPA 6010

Well Purge Data — Total Volume to Purge = 1.5

Time	Volume Purged (gallons)	Conductivity (uS/cm) x100 / x1000	Temperature degrees (C/F)	pH	Turbidity (NTU)	Dissolved Oxygen	Redox Potential	Comments
8:39	0	176.0	16.0	6.33	181.3	1.90	-015	slightly turbid, No odor
8:42	0.5	146.2	17.1	6.30	48.1	2.20	-064	slightly turbid, slight odor
8:45	1	131.1	17.1	6.35	27.2	2.19	-043	clear, no odor
8:48	1.5	123.9	18.0	6.37	15.15	2.03	-065	clear, no odor
8:52	2	117.3	18.3	6.40	9.23	1.72	-059	clear, no odor
8:56	2.5	116.9	18.9	6.41	10.86	1.83	-048	clear, no odor

Purge Water Disposition	
Drum No.	35

Well Development Summary Sheet

WELL NUMBER: MW-1

General Information
Project Name: Marine Terminal 1 South
HAI Project Number: 5106
Date: 9/10/01
Developing Personnel: Derek Sandoz
Purge Method: SUBMURSIBLE PUMP

Purge Volume Calculation

Total Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	1 Well Volume (gal)	10 Well Volumes (gal)
32	18.35	≅14	0.17	≅2.3	23

2' well = 0.17 gallons/linear ft 4" well = 0.66 gallons/linear ft

Well Purge Data **Total Volume to Purge =**

Time	Volume Purged (gallons)	Conductivity (uS/cm) x100 / x1000	Temperature degrees (C / F)	pH	Turbidity (NTU)	Dissolved Oxygen (%)	Redox Potential (%)	Comments
0	0	-	-	-	-	-	-	
14:50	4	3.49	76.0	3.48	181.0	18.2	-005	LT BROWN/VISIBLE RAINBOW SHEEN
15:00	8	3.52	77.6	7.68	106.7	10.9	-012	
15:05	13	3.45	76.3	7.65	88.2	10.1	008	
15:10	17	3.34	76.2	7.29	62.4	17.1	008	
15:20	19	3.22	74.5	7.30	1588	10.9	034	DECREASING CLARITY
15:25	23	3.15	74.5	7.31	154.6	10.9	041	

Purge Water Disposition
Drum No.

Well Development Summary Sheet

WELL NUMBER: MW-2

General Information
Project Name: Marine Terminal 1 South
HAI Project Number: 5106
Date: 9/7/01
Developing Personnel: Derek Sandoz
Purge Method: Submersible Pump

Purge Volume Calculation

Total Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	1 Well Volume (gal)	10 Well Volumes (gal)
32	24.85	≅ 8	0.17	≅ 1.5	15

2" well = 0.17 gallons/linear ft 4" well = 0.66 gallons/linear ft

Well Purge Data — **Total Volume to Purge =**

Time	Volume Purged (gallons)	Conductivity (uS/cm) x100 / x1000	Temperature degrees (C / F)	pH	Turbidity (NTU)	Dissolved Oxygen (%)	Redox Potential (%)	Comments
1545	5	3.02	67.8	6.91	NOT OPERATING	9.8	-224	
1550	9	3.02	68.5	6.90		9.9	-073	
1555	13	2.97	68.3	6.89		10.1	-072	
1609	15	2.93	67.1	6.54		8.9	-070	
1610	17	2.93	67.1	6.59		9.0	-076	
1615	19	2.94	67.1	6.62		9.1	-076	

Purge Water Disposition
Drum No.

Well Development Summary Sheet

WELL NUMBER: MW-3

General Information
Project Name: Marine Terminal 1 South
HAI Project Number: 5106
Date: 9/07/01
Developing Personnel: Derek Sandoz
Purge Method: SUBMERSIBLE PUMP

Purge Volume Calculation					
Total Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	1 Well Volume (gal)	10 Well Volumes (gal)
32	25.5	7	0.17	1.5	15

2" well = 0.17 gallons/linear ft 4" well = 0.66 gallons/linear ft

Well Purge Data — **Total Volume to Purge =**

Time	Volume Purged (gallons)	Conductivity (uS/cm) x100 / x1000	Temperature degrees (C / F)	pH	Turbidity (NTU) x200	Dissolved Oxygen (%)	Redox Potential (%)	Comments
13:30	3	3.73	84.0	6.60	N/S	6.4	-122	DK GRAY
13:40	4.5	3.50	78.7	6.65	N/S	7.3	-120	IMPROVING CLARITY
13:48	6.0	3.59	78.0	6.60	118.6	8.3	-085	
13:50	8.5	3.76	80.2	6.80	103.7	6.8	-090	
13:55	9.0	3.67	77.9	6.53	87.4	6.7	-065	
14:15	13.0	3.60	76.1	6.56	23.6	6.9	-030	
14:20	17.0	3.42	72.2	6.68	22.5	4.4	-046	DK GRAY
14:28	18.0	3.38	71.2	6.84	21.5	4.5	-046	

Purge Water Disposition
Drum No.

Well Development Summary Sheet

WELL NUMBER: MW-4

General Information
Project Name: Marine Terminal 1 South
HAI Project Number: 5106
Date: 9/10/01
Developing Personnel: Derek Sandoz
Purge Method: SUBMERSIBLE PUMP

Purge Volume Calculation

Total Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	1 Well Volume (gal)	10 Well Volumes (gal)
32	26.45	≅ 6	0.17	≅ 1	10

2" well = 0.17 gallons/linear ft 4" well = 0.66 gallons/linear ft

Well Purge Data **Total Volume to Purge =**

Time	Volume Purged (gallons)	Conductivity (uS/cm) x100 / x1000	Temperature degrees (C / F)	pH	Turbidity (NTU)	Dissolved Oxygen (%)	Redox Potential (%)	Comments
0	0	–	–	–	–	–	–	
13:20	4	3.80	87.4	7.22	> 100	5.7	60	VERY DK. GRAY, TURBID
13:30	6	3.89	87.2	7.03	69.2	6.7	-070	
13:35	8	3.96	86.4	7.68	03.7	6.7	-011	
13.40	11	3.97	85.2	7.23	-0.18	3.8	602	FLOW SLOWING. THICKENING
13:50	13	4.27	88.5	7.29	1.18	5.6	010	WELL PUMPED DRY @ 13 GALLONS
13:55	15	4.16	87.6	7.23	1.32	5.5	012	ALLOWED 5 MINS. TO RECHARGE

Purge Water Disposition
Drum No.

Well Development Summary Sheet

WELL NUMBER: MW-5

General Information
Project Name: Marine Terminal 1 South
HAI Project Number: 5106
Date: 9/6/01
Developing Personnel: Derek Sandoz
Purge Method: SUBMERSIBLE PUMP

Purge Volume Calculation					
Total Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	1 Well Volume (gal)	10 Well Volumes (gal)
34	26.68	≅ 7	0.17	≅ 1.25	12.5

2' well = 0.17 gallons/linear ft 4" well = 0.66 gallons/linear ft

Well Purge Data **Total Volume to Purge =**

Time	Volume Purged (gallons)	Conductivity (uS/cm) x100 / x1000	Temperature degrees (C / F)	pH	Turbidity (NTU)	Dissolved Oxygen (%)	Redox Potential (%)	Comments
2:35	3	2.00	66.0	6.77	190	7.4	-070	GRAY COLOR
2:40	5	2.06	66.6	6.90	168.9	11.2	-099	
2:45	7	2.02	65.7	6.61	170.1	7.0	-071	
2:50	9	1.99	65.2	6.82	147.1	10.2	-087	WELL IS NOW IN SHADE PLUS/OR CAUSE OF TEMP DROP FROM NOW
3:00	11	1.97	65.9	6.62	148.9	10.4	-086	
3:10	13	1.95	64.7	6.72	153.0	9.0	-084	
3:15	15	1.99	65.7	6.71	149.9	9.1	-083	

Purge Water Disposition
Drum No.

Well Development Summary Sheet

WELL NUMBER: MW-6

General Information
Project Name: Marine Terminal 1 South
HAI Project Number: 5106
Date: 9/6/01
Developing Personnel: Derek Sandoz
Purge Method: SUBMERSIBLE PUMP.

Purge Volume Calculation

Total Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	1 Well Volume (gal)	10 Well Volumes (gal)
32	22.17	~10	0.17	~2 gal	20

2' well = 0.17 gallons/linear ft 4" well = 0.66 gallons/linear ft

Well Purge Data **Total Volume to Purge =**

Time	Volume Purged (gallons)	Conductivity (uS/cm) (x100) x1000	Temperature degrees (C/F)	pH	Turbidity (NTU) x200	Dissolved Oxygen (%)	Redox Potential (MV	Comments
0	0	-	-	-	-	-	-	
1150	2	1.51	70.7	7.08	63.2	29.0	-006	
1200	5	2.15	74.0	6.50	29.4	19.2	-019	
1210	8	2.42	77.0	6.47	31.0	17.4	-107	
1220	11	2.49	76.8	6.49	36.4	11.8	105	
1238 GT	14	2.38	73.3	6.51	67.2	24.3	-066	
1230	17	2.38	75.3	6.47	87.4	13.3	-060	
1235	20 GT	2.50	75.5	6.55	>100	17.0	-065	
1300	25	-	-	-	>100	-	-	
1305	30	-	-	-	>100	-	-	
16:00	3	2.03	81.2	6.23	178.9	17	-066	RETURNED TO WELL (very dirty AFTER ADDL CHARGE
16:30	6	2.33	77.8	6.97	66.7	33.3	-064	ON LAMOTTE TURBIDITY METER
16.35	9	2.32	77.3	6.84	26.0	34.3	-050	=MUCH HIGHER CLARITY
16.40	12	2.31	76.9	6.85	28.6	34.3	-050	

Purge Water Disposition
Drum No.

Well Development Summary Sheet

WELL NUMBER: MW-7

General Information
Project Name: Marine Terminal 1 South
HAI Project Number: 5106
Date: 9/6/01
Developing Personnel: Derek Sandoz
Purge Method: SUBSURMIBLE PUMP

Purge Volume Calculation					
Total Well Depth (ft)	Static Water Level (ft)	Water Column (ft)	Conversion Factor (gal/foot)	1 Well Volume (gal)	10 Well Volumes (gal)
32	29.54	≅ 3	0.17	≅.5	5

2' well = 0.17 gallons/linear ft 4" well = 0.66 gallons/linear ft

Well Purge Data — **Total Volume to Purge=**

Time	Volume Purged (gallons)	Conductivity (uS/cm) x100 / x1000	Temperature degrees (C / F)	pH	Turbidity (NTU) x200	Dissolved Oxygen (%)	Redox Potential (%)	Comments
0	0	—	—	—	—	—	—	
1745	4	1.40	69.7	6.68	155.0*	5.8	-098	VERY DK GRAY/BROWN
1755	7	1.38	68.6	6.66	129.8	7.1	-126	IMPROVING CLARITY
1800	8	1.36	68.6	6.69	126.8	7.3	-044	↓
1810	9	1.32	68.3	6.71	64.7	10.1	-049	↓
1820	11	1.26	67.6	6.59	149.0	7.8	-050	GRAY DK-BROWN AGAIN
1825	12	1.21	66.6	6.51	123.0	9.8	-051	IMPROVING CLARITY
1835	13	1.16	66.0	6.57	99.1*	9.9	-054	↓
1840	14	1.10	65.1	6.61	108.7	9.7	-053	↓

Purge Water Disposition
Drum No.

* FLASH READINGS / LAMOTTE READER JUMPY

APPENDIX C

Port of Portland Well Elevation Survey

T1 Monitoring Well Locations
2000UGEN 24232-730

Northing & Easting Coordinates are NAD 83/91, Oregon North Zone established from control points on POP drawing T1 2001-500 sheet 2/2.
Elevations are NGVD 29/47, established from control points on POP drawing T1 2001-500 sheet 2/2.

Well #	Northing	Easting	Elevation North rim	Elevation PVC notch	Point #
MW-1	690210	7641039	30.68	30.39	213
MW-2	690371	7641181	28.45	28.16	212
MW-3	690494	7641288	27.97	27.56	211
MW-4	689927	7641516	30.35	29.84	216
MW-5	690090	7641639	33.23	33.04	207
MW-6	689443	7641920	30.62	30.25	201
MW-7	689564	7642164	33.76	33.51	202

APPENDIX D

Laboratory Results and Chain-of-Custody Documentation:
Soil Sample

PIH0861

HAHN AND ASSOCIATES, INC.
Environmental Management
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory NCA.
Lab Project No.

CHAIN OF CUSTODY
Chain of Custody No. 1

Project Manager Guy Tanz
Project No. 5106
Project Name T1S
Collected by Matt Mudge

Liquid with Sediment Sample
____ Test Filtrate ____ Test Sediment ____ Test Both
Multi-Phase Sample
____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N)
Appropriate Containers Used (Y or N)
Provide Verbal Results (Y or N)
Provide Preliminary Fax Results YES

Sample Number Prefix: 5106-0108

PLEASE BILL PORT
PROJECT # 24232
TASK # 730

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	NWTPH-DX	EPA 601/8 PRIORITY POLL. METALS	VOCs EPA 8260	PAHs EPA 8270 SIM	RUSH	Remarks
	27-001	8/27/01	9:50	MW-4@ 25'	X			2						
	27-002	"	13:00	MW-7@ 25'	X			1						
	27-003	"	13:08	" @5'	X			1						
	28-004	8/28/01	7:53	MW-6@ 5'	X			1	*	*	*	*		
	28-005	"	16:12	MW-3@ 25'	X			1						
	29-006	8/29/01	8:57	MW-7@ 25'	X			2						
	29-007	"	11:00	MW-5@ 25'	X			1						

Relinquished by	Company	Date	Time	Received by	Company
Guy M Tanz	HAHN & ASSOC	8/30/01	1015		NCA
	NCA	8-30-01	1704		NCA

5.2

www.ncalabs.com

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509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

RECEIVED SEP 2 2001

Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	09/18/01 12:24

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
5106-0108-28-004	P1H0861-04	Soil	08/28/01 07:53	08/31/01 07:39

North Creek Analytical - Portland

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Lisa Domenighini, Project Manager

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	09/18/01 12:24

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-0108-28-004 (P1H0861-04) Soil					Sampled: 08/28/01 Received: 08/31/01				
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	09/07/01	09/10/01	1091079	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	*86.3 %*	*50-150*							

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	09/18/01 12:24

Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-0108-28-004 (P1H0861-04) Soil					Sampled: 08/28/01 Received: 08/31/01				
Antimony	ND	0.500	mg/kg dry	1	EPA 6020	09/12/01	09/13/01	1091270	
Arsenic	**3.37**	0.500	"	"	"	"	09/13/01	"	
Beryllium	ND	0.500	"	10	"	"	"	"	
Cadmium	ND	0.500	"	"	"	"	"	"	
Chromium	**15.8**	0.500	"	"	"	"	09/13/01	"	
Copper	**17.8**	1.00	"	"	"	"	09/13/01	"	
Lead	**20.4**	0.500	"	"	"	"	"	"	
Mercury	ND	0.100	"	1	EPA 7471A	09/10/01	09/10/01	1091132	
Nickel	**19.3**	1.00	"	10	EPA 6020	09/12/01	09/13/01	1091270	
Selenium	ND	0.500	"	1	"	"	"	"	
Silver	ND	0.500	"	10	"	"	"	"	
Thallium	ND	0.500	"	1	"	"	"	"	
Zinc	**50.9**	2.50	"	10	"	"	"	"	

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	09/18/01 12:24

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-0108-28-004 (P1H0861-04) Soil					Sampled: 08/28/01 Received: 08/31/01				
Acetone	ND	2500	ug/kg dry	1	EPA 8260B	08/31/01	09/04/01	1081973	
Benzene	ND	100	"	"	"	"	"	"	
Bromobenzene	ND	100	"	"	"	"	"	"	
Bromochloromethane	ND	100	"	"	"	"	"	"	
Bromodichloromethane	ND	100	"	"	"	"	"	"	
Bromoform	ND	100	"	"	"	"	"	"	
Bromomethane	ND	500	"	"	"	"	"	"	
2-Butanone	ND	1000	"	"	"	"	"	"	
n-Butylbenzene	ND	500	"	"	"	"	"	"	
sec-Butylbenzene	ND	100	"	"	"	"	"	"	
tert-Butylbenzene	ND	100	"	"	"	"	"	"	
Carbon disulfide	ND	1000	"	"	"	"	"	"	
Carbon tetrachloride	ND	100	"	"	"	"	"	"	
Chlorobenzene	ND	100	"	"	"	"	"	"	
Chloroethane	ND	100	"	"	"	"	"	"	
Chloroform	ND	100	"	"	"	"	"	"	
Chloromethane	ND	500	"	"	"	"	"	"	
2-Chlorotoluene	ND	100	"	"	"	"	"	"	
4-Chlorotoluene	ND	100	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	500	"	"	"	"	"	"	
Dibromochloromethane	ND	100	"	"	"	"	"	"	
1,2-Dibromoethane	ND	100	"	"	"	"	"	"	
Dibromomethane	ND	100	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	100	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	100	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	100	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	500	"	"	"	"	"	"	
1,1-Dichloroethane	ND	100	"	"	"	"	"	"	
1,2-Dichloroethane	ND	100	"	"	"	"	"	"	
1,1-Dichloroethene	ND	100	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	100	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	100	"	"	"	"	"	"	
1,2-Dichloropropane	ND	100	"	"	"	"	"	"	
1,3-Dichloropropane	ND	100	"	"	"	"	"	"	
2,2-Dichloropropane	ND	100	"	"	"	"	"	"	
1,1-Dichloropropene	ND	100	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	100	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	100	"	"	"	"	"	"	
Ethylbenzene	ND	100	"	"	"	"	"	"	

North Creek Analytical - Portland

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Lisa Domenighini, Project Manager

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	09/18/01 12:24

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-0108-28-004 (P1H0861-04) Soil					Sampled: 08/28/01 Received: 08/31/01				
Hexachlorobutadiene	ND	200	ug/kg dry	1	EPA 8260B	08/31/01	09/04/01	1081973	
2-Hexanone	ND	1000	"	"	"	"	"	"	
Isopropylbenzene	ND	200	"	"	"	"	"	"	
p-Isopropyltoluene	ND	200	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	500	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	100	"	"	"	"	"	"	
Methylene chloride	ND	500	"	"	"	"	"	"	
Naphthalene	ND	200	"	"	"	"	"	"	
n-Propylbenzene	ND	100	"	"	"	"	"	"	
Styrene	ND	100	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	100	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	100	"	"	"	"	"	"	
Tetrachloroethene	ND	100	"	"	"	"	"	"	
Toluene	ND	100	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	100	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	100	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	100	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	100	"	"	"	"	"	"	
Trichloroethene	ND	100	"	"	"	"	"	"	
Trichlorofluoromethane	ND	100	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	100	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	100	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	100	"	"	"	"	"	"	
Vinyl chloride	ND	100	"	"	"	"	"	"	
o-Xylene	ND	100	"	"	"	"	"	"	
m,p-Xylene	ND	200	"	"	"	"	"	"	
Surr: 4-BFB	*97.6 %*	*70-130*							
Surr: 1,2-DCA-d4	*100 %*	*70-130*							
Surr: Dibromofluoromethane	*99.1 %*	*70-130*							
Surr: Toluene-d8	*100 %*	*70-130*							

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	09/18/01 12:24

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-0108-28-004 (P1H0861-04) Soil					Sampled: 08/28/01	Received: 08/31/01			**R-05**
Acenaphthene	ND	26.8	ug/kg dry	2	EPA 8270m	09/10/01	09/13/01	1091165	
Acenaphthylene	ND	26.8	"	"	"	"	"	"	
Anthracene	ND	26.8	"	"	"	"	"	"	
Benzo (a) anthracene	ND	26.8	"	"	"	"	"	"	
Benzo (a) pyrene	ND	26.8	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	26.8	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	26.8	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	26.8	"	"	"	"	"	"	
Chrysene	ND	26.8	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	26.8	"	"	"	"	"	"	
Fluoranthene	ND	26.8	"	"	"	"	"	"	
Fluorene	ND	26.8	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	26.8	"	"	"	"	"	"	
Naphthalene	ND	26.8	"	"	"	"	"	"	
Phenanthrene	ND	26.8	"	"	"	"	"	"	
Pyrene	ND	26.8	"	"	"	"	"	"	
Surr: Fluorene-d10	*53.2 %*	*40-150*							
Surr: Pyrene-d10	*78.2 %*	*40-150*							
Surr: Benzo (a) pyrene-d12	*54.4 %*	*40-150*							

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	09/18/01 12:24

Percent Dry Weight (Solids) per Standard Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-0108-28-004 (P1H0861-04) Soil						Sampled: 08/28/01	Received: 08/31/01		
% Solids	**94.2**	1.00	% by Weight	1	NCA SOP	09/10/01	09/11/01	1091153	

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	09/18/01 12:24

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1091079 - EPA 3550 Fuels										
Blank (1091079-BLK1)				Prepared: 09/07/01 Analyzed: 09/10/01						
Diesel Range Organics	ND	25.0	mg/kg							
Heavy Oil Range Hydrocarbons	ND	50.0	"							
Surr: 1-Chlorooctadecane	*4.28*		"	*4.80*		*89.2*	*50-150*			
LCS (1091079-BS1)				Prepared: 09/07/01 Analyzed: 09/10/01						
Diesel Range Organics	103	25.0	mg/kg	129		79.8	50-150			
Heavy Oil Range Hydrocarbons	59.7	50.0	"	79.0		75.6	50-150			
Surr: 1-Chlorooctadecane	*3.85*		"	*4.80*		*80.2*	*50-150*			
Duplicate (1091079-DUP1)		Source: P1H0783-02		Prepared: 09/07/01 Analyzed: 09/10/01						
Diesel Range Organics	ND	125	mg/kg dry		ND				50	
Heavy Oil Range Hydrocarbons	1360	250	"		1160			15.9	50	
Surr: 1-Chlorooctadecane	*5.73*		"	*6.34*		*90.4*	*50-150*			
Duplicate (1091079-DUP2)		Source: P110142-01		Prepared: 09/07/01 Analyzed: 09/11/01						
Diesel Range Organics	7060	1000	mg/kg dry		11600			48.7	50	
Heavy Oil Range Hydrocarbons	10700	2000	"		18000			50.9	50	Q-14
Surr: 1-Chlorooctadecane	*0.00*		"	*5.59*			*50-150*			*S-01*

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	09/18/01 12:24

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1091132 - EPA 7471										
Blank (1091132-BLK1)				Prepared & Analyzed: 09/10/01						
Mercury	ND	0.100	mg/kg							
LCS (1091132-BS1)				Prepared & Analyzed: 09/10/01						
Mercury	0.958	0.100	mg/kg	1.00		95.8	80-120			
Duplicate (1091132-DUP1)	Source: P110187-02			Prepared & Analyzed: 09/10/01						
Mercury	ND	0.100	mg/kg dry		ND			20.4	40	
Matrix Spike (1091132-MS1)	Source: P110187-02			Prepared & Analyzed: 09/10/01						
Mercury	0.985	0.100	mg/kg dry	1.04	ND	91.7	75-125			
Batch 1091270 - EPA 3050										
Blank (1091270-BLK1)				Prepared: 09/12/01 Analyzed: 09/13/01						
Antimony	ND	0.500	mg/kg							
Arsenic	ND	0.500	"							
Beryllium	ND	0.500	"							
Cadmium	ND	0.500	"							
Chromium	ND	0.500	"							
Copper	ND	1.00	"							
Lead	ND	0.500	"							
Nickel	ND	1.00	"							
Selenium	ND	0.500	"							
Silver	ND	0.500	"							
Thallium	ND	0.500	"							
Zinc	ND	2.50	"							

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	09/18/01 12:24

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1091270 - EPA 3050										
LCS (1091270-BS1)				Prepared: 09/12/01 Analyzed: 09/13/01						
Antimony	5.34	0.500	mg/kg	5.00		107	80-120			
Arsenic	9.98	0.500	"	10.0		99.8	80-120			
Beryllium	9.60	0.500	"	10.0		96.0	80-120			
Cadmium	10.3	0.500	"	10.0		103	80-120			
Chromium	10.9	0.500	"	10.0		109	80-120			
Copper	10.3	1.00	"	10.0		103	80-120			
Lead	9.88	0.500	"	10.0		98.8	80-120			
Nickel	10.3	1.00	"	10.0		103	80-120			
Selenium	10.4	0.500	"	10.0		104	80-120			
Silver	4.92	0.500	"	5.00		98.4	80-120			
Thallium	4.68	0.500	"	5.00		93.6	80-120			
Zinc	10.9	2.50	"	10.0		109	80-120			
Duplicate (1091270-DUP1)		**Source: P1H0861-04**		Prepared: 09/12/01 Analyzed: 09/13/01						
Antimony	ND	0.500	mg/kg dry		ND			44.4	40	Q-06
Arsenic	4.34	0.500	"		3.37			25.2	40	
Beryllium	ND	0.500	"		ND			43.8	40	Q-06
Cadmium	ND	0.500	"		ND				40	
Chromium	16.6	0.500	"		15.8			4.94	40	
Copper	22.4	1.00	"		17.8			22.9	40	
Lead	26.3	0.500	"		20.4			25.3	40	
Nickel	24.9	1.00	"		19.3			25.3	40	
Selenium	ND	0.500	"		ND			35.8	40	Q-06
Silver	ND	0.500	"		ND			40.3	40	Q-06
Thallium	ND	0.500	"		ND			62.9	40	Q-06
Zinc	65.1	2.50	"		50.9			24.5	40	
Matrix Spike (1091270-MS1)		**Source: P1H0861-04**		Prepared: 09/12/01 Analyzed: 09/13/01						
Antimony	2.77	0.500	mg/kg dry	5.31	ND	51.1	75-125			Q-07
Arsenic	15.1	0.500	"	10.6	3.37	111	75-125			
Beryllium	11.6	0.500	"	10.6	ND	107	75-125			
Cadmium	11.4	0.500	"	10.6	ND	108	75-125			
Chromium	25.8	0.500	"	10.6	15.8	94.3	75-125			
Copper	29.7	1.00	"	10.6	17.8	112	75-125			Q-07
Lead	28.4	0.500	"	10.6	20.4	75.5	75-125			Q-07
Nickel	32.8	1.00	"	10.6	19.3	127	75-125			Q-07

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	09/18/01 12:24

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1091270 - EPA 3050										
Matrix Spike (1091270-MS1)		**Source: P1H0861-04**		Prepared & Analyzed: 09/12/01						
Selenium	11.9	0.500	mg/kg dry	10.6	ND	110	75-125			
Silver	5.43	0.500	"	5.31	ND	102	75-125			
Thallium	5.32	0.500	"	5.31	ND	99.1	75-125			
Zinc	63.9	2.50	"	10.6	50.9	123	75-125			Q-03
Matrix Spike (1091270-MS2)		**Source: P1I0183-04**		Prepared: 09/12/01 Analyzed: 09/13/01						
Antimony	3.27	0.500	mg/kg dry	6.59	ND	46.9	75-125			Q-07
Arsenic	19.4	0.500	"	13.2	5.43	106	75-125			
Beryllium	16.0	0.500	"	13.2	0.923	114	75-125			
Cadmium	14.9	0.500	"	13.2	ND	113	75-125			
Chromium	49.9	0.500	"	13.2	33.8	122	75-125			
Copper	50.2	1.00	"	13.2	59.9	NR	75-125			Q-03
Lead	28.8	0.500	"	13.2	16.1	96.2	75-125			
Nickel	45.6	1.00	"	13.2	36.9	65.9	75-125			Q-07
Selenium	15.9	0.500	"	13.2	0.747	115	75-125			
Silver	7.46	0.500	"	6.59	ND	111	75-125			
Thallium	7.34	0.500	"	6.59	ND	109	75-125			
Zinc	113	2.50	"	13.2	117	NR	75-125			Q-03

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	09/18/01 12:24

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1081973 - EPA 5035										
Blank (1081973-BLK1)				Prepared: 08/31/01 Analyzed: 09/03/01						
Acetone	ND	2500	ug/kg							
Benzene	ND	100	"							
Bromobenzene	ND	100	"							
Bromochloromethane	ND	100	"							
Bromodichloromethane	ND	100	"							
Bromoform	ND	100	"							
Bromomethane	ND	500	"							
2-Butanone	ND	1000	"							
n-Butylbenzene	ND	500	"							
sec-Butylbenzene	ND	100	"							
tert-Butylbenzene	ND	100	"							
Carbon disulfide	ND	1000	"							
Carbon tetrachloride	ND	100	"							
Chlorobenzene	ND	100	"							
Chloroethane	ND	100	"							
Chloroform	ND	100	"							
Chloromethane	ND	500	"							
2-Chlorotoluene	ND	100	"							
4-Chlorotoluene	ND	100	"							
1,2-Dibromo-3-chloropropane	ND	500	"							
Dibromochloromethane	ND	100	"							
1,2-Dibromoethane	ND	100	"							
Dibromomethane	ND	100	"							
1,2-Dichlorobenzene	ND	100	"							
1,3-Dichlorobenzene	ND	100	"							
1,4-Dichlorobenzene	ND	100	"							
Dichlorodifluoromethane	ND	500	"							
1,1-Dichloroethane	ND	100	"							
1,2-Dichloroethane	ND	100	"							
1,1-Dichloroethene	ND	100	"							
cis-1,2-Dichloroethene	ND	100	"							
trans-1,2-Dichloroethene	ND	100	"							
1,2-Dichloropropane	ND	100	"							
1,3-Dichloropropane	ND	100	"							
2,2-Dichloropropane	ND	100	"							
1,1-Dichloropropene	ND	100	"							

Lisa Domenighini, Project Manager

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	09/18/01 12:24

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1081973 - EPA 5035										
Blank (1081973-BLK1)				Prepared: 08/31/01 Analyzed: 09/03/01						
cis-1,3-Dichloropropene	ND	100	ug/kg							
trans-1,3-Dichloropropene	ND	100	"							
Ethylbenzene	ND	100	"							
Hexachlorobutadiene	ND	200	"							
2-Hexanone	ND	1000	"							
Isopropylbenzene	ND	200	"							
p-Isopropyltoluene	ND	200	"							
4-Methyl-2-pentanone	ND	500	"							
Methyl tert-butyl ether	ND	100	"							
Methylene chloride	ND	500	"							
Naphthalene	ND	200	"							
n-Propylbenzene	ND	100	"							
Styrene	ND	100	"							
1,1,1,2-Tetrachloroethane	ND	100	"							
1,1,2,2-Tetrachloroethane	ND	100	"							
Tetrachloroethene	ND	100	"							
Toluene	ND	100	"							
1,2,3-Trichlorobenzene	ND	100	"							
1,2,4-Trichlorobenzene	ND	100	"							
1,1,1-Trichloroethane	ND	100	"							
1,1,2-Trichloroethane	ND	100	"							
Trichloroethene	ND	100	"							
Trichlorofluoromethane	ND	100	"							
1,2,3-Trichloropropane	ND	100	"							
1,2,4-Trimethylbenzene	ND	100	"							
1,3,5-Trimethylbenzene	ND	100	"							
Vinyl chloride	ND	100	"							
o-Xylene	ND	100	"							
m,p-Xylene	ND	200	"							
Surr: 4-BFB	*2170*		"	*2000*		*108*	*70-130*			
Surr: 1,2-DCA-d4	*2030*		"	*2000*		*102*	*70-130*			
Surr: Dibromofluoromethane	*2120*		"	*2000*		*106*	*70-130*			
Surr: Toluene-d8	*2020*		"	*2000*		*101*	*70-130*			

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	09/18/01 12:24

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1081973 - EPA 5035										
LCS (1081973-BS1)				Prepared: 08/31/01		Analyzed: 09/03/01				
Benzene	2440	100	ug/kg	2500		97.6	80-135			
Chlorobenzene	2260	100	"	2500		90.4	80-135			
1,1-Dichloroethene	2650	100	"	2500		106	60-150			
Toluene	2310	100	"	2500		92.4	80-130			
Trichloroethene	2260	100	"	2500		90.4	70-135			
Surr: 4-BFB	*2080*		"	*2000*		*104*	*70-130*			
Surr: 1,2-DCA-d4	*2080*		"	*2000*		*104*	*70-130*			
Surr: Dibromofluoromethane	*2120*		"	*2000*		*106*	*70-130*			
Surr: Toluene-d8	*2060*		"	*2000*		*103*	*70-130*			
Matrix Spike (1081973-MS1)	**Source: P1H0849-01**			Prepared: 08/31/01		Analyzed: 09/03/01				
Benzene	2480	100	ug/kg dry	2810	ND	88.3	60-135			
Chlorobenzene	2450	100	"	2810	ND	87.2	65-125			
1,1-Dichloroethene	2520	100	"	2810	ND	89.7	60-135			
Toluene	2420	100	"	2810	ND	86.1	60-125			
Trichloroethene	2320	100	"	2810	ND	82.6	60-125			
Surr: 4-BFB	*2060*		"	*2250*		*91.6*	*70-130*			
Surr: 1,2-DCA-d4	*2070*		"	*2250*		*92.0*	*70-130*			
Surr: Dibromofluoromethane	*2070*		"	*2250*		*92.0*	*70-130*			
Surr: Toluene-d8	*2030*		"	*2250*		*90.2*	*70-130*			
Matrix Spike Dup (1081973-MSD1)	**Source: P1H0849-01**			Prepared: 08/31/01		Analyzed: 09/03/01				
Benzene	2650	100	ug/kg dry	2810	ND	94.3	60-135	6.63	25	
Chlorobenzene	2540	100	"	2810	ND	90.4	65-125	3.61	25	
1,1-Dichloroethene	2650	100	"	2810	ND	94.3	60-135	5.03	25	
Toluene	2530	100	"	2810	ND	90.0	60-125	4.44	25	
Trichloroethene	2450	100	"	2810	ND	87.2	60-125	5.45	25	
Surr: 4-BFB	*2160*		"	*2250*		*96.0*	*70-130*			
Surr: 1,2-DCA-d4	*2100*		"	*2250*		*93.3*	*70-130*			
Surr: Dibromofluoromethane	*2180*		"	*2250*		*96.9*	*70-130*			
Surr: Toluene-d8	*2140*		"	*2250*		*95.1*	*70-130*			

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	09/18/01 12:24

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1091165 - EPA 3550										
Blank (1091165-BLK1)				Prepared: 09/10/01 Analyzed: 09/12/01						
Acenaphthene	ND	13.4	ug/kg							
Acenaphthylene	ND	13.4	"							
Anthracene	ND	13.4	"							
Benzo (a) anthracene	ND	13.4	"							
Benzo (a) pyrene	ND	13.4	"							
Benzo (b) fluoranthene	ND	13.4	"							
Benzo (ghi) perylene	ND	13.4	"							
Benzo (k) fluoranthene	ND	13.4	"							
Chrysene	ND	13.4	"							
Dibenzo (a,h) anthracene	ND	13.4	"							
Fluoranthene	ND	13.4	"							
Fluorene	ND	13.4	"							
Indeno (1,2,3-cd) pyrene	ND	13.4	"							
Naphthalene	ND	13.4	"							
Phenanthrene	ND	13.4	"							
Pyrene	ND	13.4	"							
Surr: Fluorene-d10	*49.9*		"	*82.6*		*60.4*	*40-150*			
Surr: Pyrene-d10	*80.1*		"	*83.3*		*96.2*	*40-150*			
Surr: Benzo (a) pyrene-d12	*44.3*		"	*82.0*		*54.0*	*40-150*			
LCS (1091165-BS1)				Prepared: 09/10/01 Analyzed: 09/12/01						
Acenaphthene	112	13.4	ug/kg	167		67.1	33-139			
Benzo (a) pyrene	114	13.4	"	167		68.3	45-149			
Pyrene	136	13.4	"	167		81.4	39-138			
Surr: Fluorene-d10	*50.9*		"	*82.6*		*61.6*	*40-150*			
Surr: Pyrene-d10	*82.1*		"	*83.3*		*98.6*	*40-150*			
Surr: Benzo (a) pyrene-d12	*47.6*		"	*82.0*		*58.0*	*40-150*			

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Hahn and Associates, Inc.	Project: TI South	
434 NW Sixth Ave., Suite 203	Project Number: 5106	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	09/18/01 12:24

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1091165 - EPA 3550										
Matrix Spike (1091165-MS1)	**Source: P1H0860-03**			Prepared: 09/10/01		Analyzed: 09/13/01				**R-05**
Acenaphthene	128	26.8	ug/kg dry	182	ND	65.2	33-139			
Benzo (a) pyrene	244	26.8	"	182	441	NR	45-149			Q-14
Pyrene	371	26.8	"	182	1360	NR	39-138			Q-14
Surr: Fluorene-d10	*72.8*		"	*90.1*		*80.8*	*40-150*			
Surr: Pyrene-d10	*78.9*		"	*90.9*		*86.8*	*40-150*			
Surr: Benzo (a) pyrene-d12	*51.5*		"	*89.5*		*57.5*	*40-150*			
Matrix Spike Dup (1091165-MSD1)	**Source: P1H0860-03**			Prepared: 09/10/01		Analyzed: 09/13/01				**R-05**
Acenaphthene	148	26.8	ug/kg dry	182	ND	76.2	33-139	14.5	60	
Benzo (a) pyrene	1660	53.6	"	182	441	NR	45-149	149	60	Q-14
Pyrene	1140	26.8	"	182	1360	NR	39-138	102	60	Q-14
Surr: Fluorene-d10	*67.5*		"	*90.1*		*74.9*	*40-150*			
Surr: Pyrene-d10	*96.8*		"	*90.9*		*106*	*40-150*			
Surr: Benzo (a) pyrene-d12	*55.6*		"	*89.5*		*62.1*	*40-150*			

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	09/18/01 12:24

Percent Dry Weight (Solids) per Standard Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1091153 - Dry Weight										
Duplicate (1091153-DUP1)		**Source: P1H0811-01**		Prepared: 09/10/01 Analyzed: 09/11/01						
% Solids	96.0	1.00	% by Weight		93.3			2.85	20	
Duplicate (1091153-DUP2)		**Source: P1I0004-05**		Prepared: 09/10/01 Analyzed: 09/11/01						
% Solids	80.1	1.00	% by Weight		92.9			14.8	20	
Duplicate (1091153-DUP3)		**Source: P1I0009-03**		Prepared: 09/10/01 Analyzed: 09/11/01						
% Solids	70.4	1.00	% by Weight		70.8			0.567	20	
Duplicate (1091153-DUP4)		**Source: P1I0159-03**		Prepared: 09/10/01 Analyzed: 09/11/01						
% Solids	79.2	1.00	% by Weight		79.1			0.126	20	
Duplicate (1091153-DUP5)		**Source: P1I0172-06**		Prepared: 09/10/01 Analyzed: 09/11/01						
% Solids	87.7	1.00	% by Weight		86.0			1.96	20	

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	09/18/01 12:24

Notes and Definitions

Q-03	The RPD and/or percent recovery for this QC spike sample cannot be accurately calculated due to the high concentration of analyte already present in the sample.
Q-06	Analyses are not controlled on RPD values from sample concentrations less than 5 times the reporting limit.
Q-07	The recovery of this spike is outside control limits due to sample dilution required from high analyte concentration and/or matrix interferences.
Q-14	The Spike Recovery and/or RPD is outside of control limits due to a non-homogeneous sample matrix.
R-05	Reporting limits raised due to dilution necessary for analysis. Sample contains high levels of reported analyte, non-target analyte, and/or matrix interference.
S-01	The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis. MRLs are adjusted if %Solids are less than 50%.
wet	Sample results reported on a wet weight basis (as received)
RPD	Relative Percent Difference

APPENDIX E

Laboratory Results and Chain-of-Custody Documentation: September/October 2001 Groundwater Monitoring Samples

HAHN AND ASSOCIATES, INC.
Environmental Management
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory NCA
Lab Project No.
RECEIVED OCT 2 4 2001

CHAIN OF CUSTODY

Chain of Custody No. 1

Project Manager	Guy Tauz
Project No.	516
Project Name	TIS
Collected by	Matt Mudge

Liquid with Sediment Sample: ____ Test Filtrate ____ Test Sediment ____ Test Both
Multi-Phase Sample: ____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N)
Appropriate Containers Used (Y or N)
Provide Verbal Results (Y or N) NC
Provide Preliminary Fax Results YES

Sample Number Prefix: 5106-010928-

BILL PORT OF PORTLAND

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Water	Other	Number of Containers	EPA 8260 B (VOCs)	DW THH-Dx	EPA 8270 SIM (PAHs)	EPA 8270 (DEHP)	EPA 6010 As,Cu,Pb (FILTERED)	EPA 6010 As,Cu,Pb (UNFILTERED)	EPA 6010 Cd,Cr,Hg,Zn,Ag (UNFILTERED)	EPA 160.1 (TSS)		RUSH	Remarks
	101	9/28/01	0800	Trip Blank	X			4											HOLD
	102		11:24	MW-5	X			4			*		*	*		*			
	103		13:12	MW-3	X			4			*		*	*		*			
	104		14:25	MW-4	X			8	*	*	*		*	*	*	*			
	105		15:30	MW-6	X			5			*	*	*	*		*			

Relinquished by	Company	Date	Time	Received by	Company
M.S. Mudge	HAHN & ASSOC	10/2/01	1325		NCA
	NCA	10-2-01	1550		NCA

5.7°C

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
5106-010928-102	P1J0098-02	Water	09/28/01 11:24	10/02/01 15:50
5106-010928-103	P1J0098-03	Water	09/28/01 13:12	10/02/01 15:50
5106-010928-104	P1J0098-04	Water	09/28/01 14:25	10/02/01 15:50
5106-010928-105	P1J0098-05	Water	09/28/01 15:30	10/02/01 15:50

North Creek Analytical - Portland

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Lisa Domenighini, Project Manager

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-010928-104 (P1J0098-04) Water						Sampled: 09/28/01	Received: 10/02/01		
Diesel Range Organics	ND	0.250	mg/l	1	NWTPH-Dx	10/03/01	10/04/01	1100139	
Heavy Oil Range Hydrocarbons	ND	0.500	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	*101 %*	*50-150*							

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-010928-102 (P1J0098-02) Water					Sampled: 09/28/01 Received: 10/02/01				
Arsenic	**0.0121**	0.00100	mg/l	1	EPA 6020	10/10/01	10/11/01	1100451	
Copper	**0.00295**	0.00200	"	"	"	"	"	"	
Lead	**0.00146**	0.00100	"	"	"	"	"	"	
5106-010928-103 (P1J0098-03) Water					Sampled: 09/28/01 Received: 10/02/01				
Arsenic	**0.0140**	0.00100	mg/l	1	EPA 6020	10/10/01	10/11/01	1100451	
Copper	**0.0402**	0.00200	"	"	"	"	"	"	
Lead	**0.0362**	0.00100	"	"	"	"	"	"	
5106-010928-104 (P1J0098-04) Water					Sampled: 09/28/01 Received: 10/02/01				
Arsenic	**0.00645**	0.00100	mg/l	1	EPA 6020	10/10/01	10/11/01	1100451	
Cadmium	ND	0.00100	"	"	"	"	"	"	
Chromium	**0.00512**	0.00100	"	"	"	"	"	"	
Copper	**0.00448**	0.00200	"	"	"	"	"	"	
Lead	**0.00249**	0.00100	"	"	"	"	"	"	
Mercury	ND	0.000200	"	"	EPA 7470A	10/11/01	10/12/01	1100490	
Nickel	**0.00386**	0.00200	"	"	EPA 6020	10/10/01	10/11/01	1100451	
Silver	ND	0.00100	"	"	"	"	"	"	
Zinc	**0.00906**	0.00500	"	"	"	"	"	"	
5106-010928-105 (P1J0098-05) Water					Sampled: 09/28/01 Received: 10/02/01				
Arsenic	**0.00272**	0.00100	mg/l	1	EPA 6020	10/10/01	10/11/01	1100451	
Copper	**0.00251**	0.00200	"	"	"	"	"	"	
Lead	ND	0.00100	"	"	"	"	"	"	
Zinc	**0.0116**	0.00500	"	"	"	"	"	"	

Lisa Domenighini, Project Manager

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Dissolved Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-010928-102 (P1J0098-02) Water					Sampled: 09/28/01 Received: 10/02/01				
Arsenic	**0.0113**	0.00100	mg/l	1	EPA 6020	10/12/01	10/16/01	1100551	
Copper	ND	0.00200	"	"	"	"	10/16/01	"	
Lead	ND	0.00100	"	"	"	"	"	"	
5106-010928-103 (P1J0098-03) Water					Sampled: 09/28/01 Received: 10/02/01				
Arsenic	**0.0110**	0.00100	mg/l	1	EPA 6020	10/12/01	10/16/01	1100551	
Copper	ND	0.00200	"	"	"	"	10/16/01	"	
Lead	ND	0.00100	"	"	"	"	"	"	
5106-010928-104 (P1J0098-04) Water					Sampled: 09/28/01 Received: 10/02/01				
Arsenic	**0.00651**	0.00100	mg/l	1	EPA 6020	10/12/01	10/16/01	1100551	
Copper	ND	0.00200	"	"	"	"	10/16/01	"	
Lead	ND	0.00100	"	"	"	"	"	"	
5106-010928-105 (P1J0098-05) Water					Sampled: 09/28/01 Received: 10/02/01				
Arsenic	**0.00365**	0.00100	mg/l	1	EPA 6020	10/12/01	10/16/01	1100551	
Copper	ND	0.00200	"	"	"	"	10/16/01	"	
Lead	ND	0.00100	"	"	"	"	"	"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-010928-104 (P1J0098-04) Water					Sampled: 09/28/01 Received: 10/02/01				
Acetone	ND	25.0	ug/l	1	EPA 8260B	10/04/01	10/04/01	1100190	
Benzene	ND	1.00	"	"	"	"	"	"	
Bromobenzene	ND	1.00	"	"	"	"	"	"	
Bromochloromethane	ND	1.00	"	"	"	"	"	"	
Bromodichloromethane	ND	1.00	"	"	"	"	"	"	
Bromoform	ND	1.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.00	"	"	"	"	"	"	
sec-Butylbenzene	ND	1.00	"	"	"	"	"	"	
tert-Butylbenzene	ND	1.00	"	"	"	"	"	"	
Carbon disulfide	ND	10.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.00	"	"	"	"	"	"	
Chlorobenzene	ND	1.00	"	"	"	"	"	"	
Chloroethane	ND	1.00	"	"	"	"	"	"	
Chloroform	ND	1.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
2-Chlorotoluene	ND	1.00	"	"	"	"	"	"	
4-Chlorotoluene	ND	1.00	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	1.00	"	"	"	"	"	"	
1,2-Dibromoethane	ND	1.00	"	"	"	"	"	"	
Dibromomethane	ND	1.00	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.00	"	"	"	"	"	"	
1,3-Dichloropropane	ND	1.00	"	"	"	"	"	"	
2,2-Dichloropropane	ND	1.00	"	"	"	"	"	"	
1,1-Dichloropropene	ND	1.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	1.00	"	"	"	"	"	"	
Ethylbenzene	ND	1.00	"	"	"	"	"	"	

Lisa Domenighini, Project Manager

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-010928-104 (P1J0098-04) Water					Sampled: 09/28/01 Received: 10/02/01				
Hexachlorobutadiene	ND	2.00	ug/l	1	EPA 8260B	10/04/01	10/04/01	1100190	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
Isopropylbenzene	ND	2.00	"	"	"	"	"	"	
p-Isopropyltoluene	ND	2.00	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	5.00	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	1.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
Naphthalene	ND	2.00	"	"	"	"	"	"	
n-Propylbenzene	ND	1.00	"	"	"	"	"	"	
Styrene	ND	1.00	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	1.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.00	"	"	"	"	"	"	
Tetrachloroethene	ND	1.00	"	"	"	"	"	"	
Toluene	ND	1.00	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.00	"	"	"	"	"	"	
Trichloroethene	ND	1.00	"	"	"	"	"	"	
Trichlorofluoromethane	ND	1.00	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	1.00	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.00	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.00	"	"	"	"	"	"	
Vinyl chloride	ND	1.00	"	"	"	"	"	"	
o-Xylene	ND	1.00	"	"	"	"	"	"	
m,p-Xylene	ND	2.00	"	"	"	"	"	"	
Surr: 4-BFB	*110 %*	*75-125*							
Surr: 1,2-DCA-d4	*110 %*	*75-125*							
Surr: Dibromofluoromethane	*111 %*	*75-125*							
Surr: Toluene-d8	*104 %*	*75-125*							

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-010928-105 (P1J0098-05) Water						Sampled: 09/28/01	Received: 10/02/01		
Bis(2-ethylhexyl)phthalate	ND	10.0	ug/l	1	EPA 8270C	10/04/01	10/10/01	1100188	
Surr: 2-Fluorobiphenyl	*56.6 %*	*26-135*							
Surr: Nitrobenzene-d5	*84.3 %*	*23-147*							
Surr: p-Terphenyl-d14	*111 %*	*38-149*							

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-010928-102 (P1J0098-02) Water					Sampled: 09/28/01 Received: 10/02/01				
Acenaphthene	**0.448**	0.100	ug/l	1	EPA 8270m	10/04/01	10/08/01	1100208	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Fluoranthene	ND	0.100	"	"	"	"	"	"	
Fluorene	ND	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	ND	0.100	"	"	"	"	"	"	
Phenanthrene	**1.16**	0.100	"	"	"	"	"	"	
Pyrene	**0.172**	0.100	"	"	"	"	"	"	
Surr: Fluorene-d10	*66.1 %*	*25-105*							
Surr: Pyrene-d10	*87.3 %*	*30-130*							
Surr: Benzo (a) pyrene-d12	*55.9 %*	*22-120*							
5106-010928-103 (P1J0098-03) Water					Sampled: 09/28/01 Received: 10/02/01				
Acenaphthene	**0.192**	0.100	ug/l	1	EPA 8270m	10/04/01	10/10/01	1100208	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Fluoranthene	ND	0.100	"	"	"	"	"	"	
Fluorene	ND	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	ND	0.100	"	"	"	"	"	"	
Phenanthrene	**0.138**	0.100	"	"	"	"	"	"	
Pyrene	ND	0.100	"	"	"	"	"	"	
Surr: Fluorene-d10	*70.8 %*	*25-105*							

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Hahn and Associates, Inc.	Project: TI South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-010928-103 (P1J0098-03) Water						Sampled: 09/28/01	Received: 10/02/01		
Surr: Pyrene-d10	*89.8 %*	*30-130*							
Surr: Benzo (a) pyrene-d12	*46.2 %*	*22-120*							
5106-010928-104 (P1J0098-04) Water						Sampled: 09/28/01	Received: 10/02/01		
Acenaphthene	**0.720**	0.100	ug/l	1	EPA 8270m	10/04/01	10/10/01	1100208	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Fluoranthene	ND	0.100	"	"	"	"	"	"	
Fluorene	ND	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	**0.291**	0.100	"	"	"	"	"	"	
Phenanthrene	**0.576**	0.100	"	"	"	"	"	"	
Pyrene	**0.123**	0.100	"	"	"	"	"	"	
Surr: Fluorene-d10	*90.7 %*	*25-105*							
Surr: Pyrene-d10	*115 %*	*30-130*							
Surr: Benzo (a) pyrene-d12	*75.0 %*	*22-120*							
5106-010928-105 (P1J0098-05) Water						Sampled: 09/28/01	Received: 10/02/01		
Acenaphthene	ND	0.100	ug/l	1	EPA 8270m	10/04/01	10/10/01	1100208	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Fluoranthene	ND	0.100	"	"	"	"	"	"	
Fluorene	ND	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	

Lisa Domenighini, Project Manager

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Hahn and Associates, Inc.	Project: TI South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-010928-105 (P1J0098-05) Water						Sampled: 09/28/01	Received: 10/02/01		
Naphthalene	ND	0.100	ug/l	1	EPA 8270m	10/04/01	10/10/01	1100208	
Phenanthrene	ND	0.100	"	"	"	"	"	"	
Pyrene	ND	0.100	"	"	"	"	"	"	
Surr: Fluorene-d10	*81.4 %*	*25-105*							
Surr: Pyrene-d10	*107 %*	*30-130*							
Surr: Benzo (a) pyrene-d12	*63.1 %*	*22-120*							

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Conventional Chemistry Parameters per APHA/EPA Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-010928-102 (P1J0098-02) Water					Sampled: 09/28/01 Received: 10/02/01				
Total Suspended Solids	**108**	25.0	mg/l	1	EPA 160.2	10/05/01	10/09/01	1100243	
5106-010928-103 (P1J0098-03) Water					Sampled: 09/28/01 Received: 10/02/01				
Total Suspended Solids	**720**	50.0	mg/l	1	EPA 160.2	10/05/01	10/09/01	1100243	
5106-010928-104 (P1J0098-04) Water					Sampled: 09/28/01 Received: 10/02/01				
Total Suspended Solids	**130**	20.0	mg/l	1	EPA 160.2	10/05/01	10/09/01	1100243	
5106-010928-105 (P1J0098-05) Water					Sampled: 09/28/01 Received: 10/02/01				
Total Suspended Solids	**50.0**	20.0	mg/l	1	EPA 160.2	10/05/01	10/09/01	1100243	

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100139 - EPA 3510 Fuels										
Blank (1100139-BLK1)				Prepared & Analyzed: 10/03/01						
Diesel Range Organics	ND	0.250	mg/l							
Heavy Oil Range Hydrocarbons	ND	0.500	"							
Surr: 1-Chlorooctadecane	*0.0851*		"	*0.0960*		*88.6*	*50-150*			
LCS (1100139-BS1)				Prepared & Analyzed: 10/03/01						
Diesel Range Organics	2.51	0.250	mg/l	2.58		97.3	50-150			
Heavy Oil Range Hydrocarbons	1.65	0.500	"	1.58		104	50-150			
Surr: 1-Chlorooctadecane	*0.0923*		"	*0.0960*		*96.1*	*50-150*			
LCS Dup (1100139-BSD1)				Prepared & Analyzed: 10/03/01						
Diesel Range Organics	2.49	0.250	mg/l	2.58		96.5	50-150	0.800	50	
Heavy Oil Range Hydrocarbons	1.69	0.500	"	1.58		107	50-150	2.40	50	
Surr: 1-Chlorooctadecane	*0.0911*		"	*0.0960*		*94.9*	*50-150*			

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100451 - EPA 200/3005										
Blank (1100451-BLK1)				Prepared: 10/10/01 Analyzed: 10/11/01						
Arsenic	ND	0.00100	mg/l							
Cadmium	ND	0.00100	"							
Chromium	ND	0.00100	"							
Copper	ND	0.00200	"							
Lead	ND	0.00100	"							
Nickel	ND	0.00200	"							
Silver	ND	0.00100	"							
Zinc	ND	0.00500	"							
LCS (1100451-BS1)				Prepared: 10/10/01 Analyzed: 10/11/01						
Arsenic	0.104	0.00100	mg/l	0.100		104	80-120			
Cadmium	0.104	0.00100	"	0.100		104	80-120			
Chromium	0.103	0.00100	"	0.100		103	80-120			
Copper	0.103	0.00200	"	0.100		103	80-120			
Lead	0.104	0.00100	"	0.100		104	80-120			
Nickel	0.102	0.00200	"	0.100		102	80-120			
Silver	0.0497	0.00100	"	0.0500		99.4	80-120			
Zinc	0.106	0.00500	"	0.100		106	80-120			
Duplicate (1100451-DUP1)		**Source: P1J0097-03**		Prepared: 10/10/01 Analyzed: 10/11/01						
Arsenic	0.00222	0.00100	mg/l		0.00201			9.93	20	
Cadmium	ND	0.00100	"		ND				20	
Chromium	0.00294	0.00100	"		0.00325			10.0	20	
Copper	0.00415	0.00200	"		0.00474			13.3	20	
Lead	0.00102	0.00100	"		0.00116			12.8	20	
Nickel	0.00502	0.00200	"		0.00525			4.48	20	
Silver	ND	0.00100	"		ND				20	
Zinc	0.00914	0.00500	"		0.0106			14.8	20	

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100451 - EPA 200/3005										
Matrix Spike (1100451-MS1)	Source: P1J0097-03			Prepared: 10/10/01		Analyzed: 10/11/01				
Arsenic	0.0929	0.00870	mg/l	0.100	ND	90.9	75-125			
Cadmium	0.0931	0.00870	"	0.100	ND	93.0	75-125			
Chromium	0.112	0.00100	"	0.100	0.00325	109	75-125			
Copper	0.111	0.00200	"	0.100	0.00474	106	75-125			
Lead	0.109	0.00100	"	0.100	0.00116	108	75-125			
Nickel	0.109	0.00200	"	0.100	0.00525	104	75-125			
Silver	0.0519	0.00100	"	0.0500	ND	103	75-125			
Zinc	0.116	0.00500	"	0.100	0.0106	105	75-125			
Matrix Spike (1100451-MS2)	Source: P1J0097-04			Prepared: 10/10/01		Analyzed: 10/11/01				
Arsenic	0.104	0.00100	mg/l	0.100	0.00106	103	75-125			
Cadmium	0.102	0.00100	"	0.100	ND	102	75-125			
Chromium	0.102	0.00100	"	0.100	0.00265	99.4	75-125			
Copper	0.101	0.00200	"	0.100	0.00388	97.1	75-125			
Lead	0.0995	0.00100	"	0.100	ND	98.5	75-125			
Nickel	0.101	0.00200	"	0.100	0.00449	96.5	75-125			
Silver	0.0480	0.00100	"	0.0500	ND	95.6	75-125			
Zinc	0.106	0.00500	"	0.100	0.00843	97.6	75-125			
Batch 1100490 - EPA 7470										
Blank (1100490-BLK1)				Prepared: 10/11/01		Analyzed: 10/12/01				
Mercury	ND	0.000200	mg/l							
LCS (1100490-BS1)				Prepared: 10/11/01		Analyzed: 10/12/01				
Mercury	0.00486	0.000200	mg/l	0.00500		97.2	80-120			

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100490 - EPA 7470										
Duplicate (1100490-DUP1)		**Source: P1J0098-04**		Prepared: 10/11/01 Analyzed: 10/12/01						
Mercury	ND	0.000200	mg/l		ND				20	
Matrix Spike (1100490-MS1)		**Source: P1J0098-04**		Prepared: 10/11/01 Analyzed: 10/12/01						
Mercury	0.00487	0.000200	mg/l	0.00500	ND	97.4	75-125			

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Dissolved Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100551 - EPA 200/3005 Diss										
Blank (1100551-BLK1)				Prepared: 10/12/01 Analyzed: 10/16/01						
Arsenic	ND	0.00819	mg/l							
Copper	ND	0.00200	"							
Lead	ND	0.00100	"							
LCS (1100551-BS1)				Prepared: 10/12/01 Analyzed: 10/16/01						
Arsenic	0.102	0.00100	mg/l	0.100		102	80-120			
Copper	0.102	0.00200	"	0.100		102	80-120			
Lead	0.101	0.00100	"	0.100		101	80-120			
Duplicate (1100551-DUP1)	Source: P1J0097-01			Prepared: 10/12/01 Analyzed: 10/16/01						Q-06
Arsenic	ND	0.00100	mg/l		ND			92.1	20	
Copper	ND	0.00200	"		ND			40.0	20	Q-06
Lead	ND	0.00100	"		ND			137	20	Q-06
Matrix Spike (1100551-MS1)	Source: P1J0097-01			Prepared: 10/12/01 Analyzed: 10/16/01						
Arsenic	0.102	0.00100	mg/l	0.100	ND	102	75-125			
Copper	0.0995	0.00200	"	0.100	ND	98.8	75-125			
Lead	0.0978	0.00100	"	0.100	ND	97.6	75-125			
Matrix Spike (1100551-MS2)	Source: P1J0192-01			Prepared: 10/12/01 Analyzed: 10/16/01						
Arsenic	0.102	0.00100	mg/l	0.100	ND	102	75-125			
Copper	0.100	0.00200	"	0.100	ND	99.3	75-125			
Lead	0.0957	0.00100	"	0.100	ND	95.6	75-125			

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100190 - EPA 5030B										
Blank (1100190-BLK1)				Prepared & Analyzed: 10/04/01						
Acetone	ND	25.0	ug/l							
Benzene	ND	1.00	"							
Bromobenzene	ND	1.00	"							
Bromochloromethane	ND	1.00	"							
Bromodichloromethane	ND	1.00	"							
Bromoform	ND	1.00	"							
Bromomethane	ND	5.00	"							
2-Butanone	ND	10.0	"							
n-Butylbenzene	ND	5.00	"							
sec-Butylbenzene	ND	1.00	"							
tert-Butylbenzene	ND	1.00	"							
Carbon disulfide	ND	10.0	"							
Carbon tetrachloride	ND	1.00	"							
Chlorobenzene	ND	1.00	"							
Chloroethane	ND	1.00	"							
Chloroform	ND	1.00	"							
Chloromethane	ND	5.00	"							
2-Chlorotoluene	ND	1.00	"							
4-Chlorotoluene	ND	1.00	"							
1,2-Dibromo-3-chloropropane	ND	5.00	"							
Dibromochloromethane	ND	1.00	"							
1,2-Dibromoethane	ND	1.00	"							
Dibromomethane	ND	1.00	"							
1,2-Dichlorobenzene	ND	1.00	"							
1,3-Dichlorobenzene	ND	1.00	"							
1,4-Dichlorobenzene	ND	1.00	"							
Dichlorodifluoromethane	ND	5.00	"							
1,1-Dichloroethane	ND	1.00	"							
1,2-Dichloroethane	ND	1.00	"							
1,1-Dichloroethene	ND	1.00	"							
cis-1,2-Dichloroethene	ND	1.00	"							
trans-1,2-Dichloroethene	ND	1.00	"							
1,2-Dichloropropane	ND	1.00	"							
1,3-Dichloropropane	ND	1.00	"							
2,2-Dichloropropane	ND	1.00	"							
1,1-Dichloropropene	ND	1.00	"							

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Hahn and Associates, Inc.	Project: TI South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100190 - EPA 5030B										
Blank (1100190-BLK1)				Prepared & Analyzed: 10/04/01						
cis-1,3-Dichloropropene	ND	1.00	ug/l							
trans-1,3-Dichloropropene	ND	1.00	"							
Ethylbenzene	ND	1.00	"							
Hexachlorobutadiene	ND	2.00	"							
2-Hexanone	ND	10.0	"							
Isopropylbenzene	ND	2.00	"							
p-Isopropyltoluene	ND	2.00	"							
4-Methyl-2-pentanone	ND	5.00	"							
Methyl tert-butyl ether	ND	1.00	"							
Methylene chloride	ND	5.00	"							
Naphthalene	ND	2.00	"							
n-Propylbenzene	ND	1.00	"							
Styrene	ND	1.00	"							
1,1,1,2-Tetrachloroethane	ND	1.00	"							
1,1,2,2-Tetrachloroethane	ND	1.00	"							
Tetrachloroethene	ND	1.00	"							
Toluene	ND	1.00	"							
1,2,3-Trichlorobenzene	ND	1.00	"							
1,2,4-Trichlorobenzene	ND	1.00	"							
1,1,1-Trichloroethane	ND	1.00	"							
1,1,2-Trichloroethane	ND	1.00	"							
Trichloroethene	ND	1.00	"							
Trichlorofluoromethane	ND	1.00	"							
1,2,3-Trichloropropane	ND	1.00	"							
1,2,4-Trimethylbenzene	ND	1.00	"							
1,3,5-Trimethylbenzene	ND	1.00	"							
Vinyl chloride	ND	1.00	"							
o-Xylene	ND	1.00	"							
m,p-Xylene	ND	2.00	"							
Surr: 4-BFB	*21.6*		"	*20.0*		*108*	*75-125*			
Surr: 1,2-DCA-d4	*21.6*		"	*20.0*		*108*	*75-125*			
Surr: Dibromofluoromethane	*20.2*		"	*20.0*		*101*	*75-125*			
Surr: Toluene-d8	*20.4*		"	*20.0*		*102*	*75-125*			

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100190 - EPA 5030B										
LCS (1100190-BS1)				Prepared & Analyzed: 10/04/01						
Benzene	20.4	1.00	ug/l	20.0		102	80-125			
Chlorobenzene	23.6	1.00	"	20.0		118	80-125			
1,1-Dichloroethene	19.6	1.00	"	20.0		98.0	70-135			
Toluene	21.8	1.00	"	20.0		109	80-125			
Trichloroethene	19.2	1.00	"	20.0		96.0	70-130			
Surr: 4-BFB	*23.0*		"	*20.0*		*115*	*75-125*			
Surr: 1,2-DCA-d4	*21.6*		"	*20.0*		*108*	*75-125*			
Surr: Dibromofluoromethane	*19.7*		"	*20.0*		*98.5*	*75-125*			
Surr: Toluene-d8	*20.9*		"	*20.0*		*104*	*75-125*			
Matrix Spike (1100190-MS1)	**Source: P1J0057-04**			Prepared & Analyzed: 10/04/01						
Benzene	19.8	1.00	ug/l	20.0	ND	97.7	80-125			
Chlorobenzene	22.3	1.00	"	20.0	ND	112	80-125			
1,1-Dichloroethene	20.0	1.00	"	20.0	ND	100	70-135			
Toluene	21.3	1.00	"	20.0	ND	106	80-125			
Trichloroethene	18.4	1.00	"	20.0	ND	89.0	70-130			
Surr: 4-BFB	*22.5*		"	*20.0*		*112*	*75-125*			
Surr: 1,2-DCA-d4	*20.7*		"	*20.0*		*104*	*75-125*			
Surr: Dibromofluoromethane	*20.8*		"	*20.0*		*104*	*75-125*			
Surr: Toluene-d8	*20.9*		"	*20.0*		*104*	*75-125*			
Matrix Spike Dup (1100190-MSD1)	**Source: P1J0057-04**			Prepared & Analyzed: 10/04/01						
Benzene	20.0	1.00	ug/l	20.0	ND	98.7	80-125	1.01	25	
Chlorobenzene	22.1	1.00	"	20.0	ND	110	80-125	0.901	25	
1,1-Dichloroethene	19.6	1.00	"	20.0	ND	98.0	70-135	2.02	25	
Toluene	21.0	1.00	"	20.0	ND	105	80-125	1.42	25	
Trichloroethene	18.5	1.00	"	20.0	ND	89.4	70-130	0.542	25	
Surr: 4-BFB	*22.4*		"	*20.0*		*112*	*75-125*			
Surr: 1,2-DCA-d4	*21.0*		"	*20.0*		*105*	*75-125*			
Surr: Dibromofluoromethane	*20.5*		"	*20.0*		*102*	*75-125*			
Surr: Toluene-d8	*20.8*		"	*20.0*		*104*	*75-125*			

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100188 - EPA 3510/600 Series										
Blank (1100188-BLK1)				Prepared: 10/04/01 Analyzed: 10/10/01						
Acenaphthene	ND	5.00	ug/l							
Acenaphthylene	ND	5.00	"							
Anthracene	ND	5.00	"							
Benzo (a) anthracene	ND	5.00	"							
Benzo (a) pyrene	ND	5.00	"							
Benzo (b) fluoranthene	ND	5.00	"							
Benzo (ghi) perylene	ND	5.00	"							
Benzo (k) fluoranthene	ND	5.00	"							
Benzoic Acid	ND	50.0	"							
Benzyl alcohol	ND	10.0	"							
4-Bromophenyl phenyl ether	ND	5.00	"							
Butyl benzyl phthalate	ND	5.00	"							
4-Chloro-3-methylphenol	ND	5.00	"							
4-Chloroaniline	ND	20.0	"							
Bis(2-chloroethoxy)methane	ND	10.0	"							
Bis(2-chloroethyl)ether	ND	5.00	"							
Bis(2-chloroisopropyl)ether	ND	10.0	"							
2-Chloronaphthalene	ND	5.00	"							
2-Chlorophenol	ND	5.00	"							
4-Chlorophenyl phenyl ether	ND	5.00	"							
Chrysene	ND	5.00	"							
Di-n-butyl phthalate	ND	5.00	"							
Di-n-octyl phthalate	ND	5.00	"							
Dibenzo (a,h) anthracene	ND	5.00	"							
Dibenzofuran	ND	5.00	"							
1,2-Dichlorobenzene	ND	5.00	"							
1,3-Dichlorobenzene	ND	5.00	"							
1,4-Dichlorobenzene	ND	5.00	"							
3,3'-Dichlorobenzidine	ND	5.00	"							
2,4-Dichlorophenol	ND	5.00	"							
Diethyl phthalate	ND	5.00	"							
2,4-Dimethylphenol	ND	10.0	"							
Dimethyl phthalate	ND	5.00	"							
4,6-Dinitro-2-methylphenol	ND	10.0	"							
2,4-Dinitrophenol	ND	25.0	"							
2,4-Dinitrotoluene	ND	5.00	"							

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100188 - EPA 3510/600 Series										
Blank (1100188-BLK1)				Prepared: 10/04/01 Analyzed: 10/10/01						
2,6-Dinitrotoluene	ND	5.00	ug/l							
Bis(2-ethylhexyl)phthalate	ND	10.0	"							
Fluoranthene	ND	5.00	"							
Fluorene	ND	5.00	"							
Hexachlorobenzene	ND	5.00	"							
Hexachlorobutadiene	ND	10.0	"							
Hexachlorocyclopentadiene	ND	10.0	"							
Hexachloroethane	ND	10.0	"							
Indeno (1,2,3-cd) pyrene	ND	5.00	"							
Isophorone	ND	5.00	"							
2-Methylnaphthalene	ND	5.00	"							
2-Methylphenol	ND	10.0	"							
3-,4-Methylphenol	ND	5.00	"							
Naphthalene	ND	5.00	"							
2-Nitroaniline	ND	5.00	"							
3-Nitroaniline	ND	10.0	"							
4-Nitroaniline	ND	10.0	"							
Nitrobenzene	ND	5.00	"							
2-Nitrophenol	ND	5.00	"							
4-Nitrophenol	ND	25.0	"							
N-Nitrosodi-n-propylamine	ND	10.0	"							
N-Nitrosodiphenylamine	ND	5.00	"							
Pentachlorophenol	ND	10.0	"							
Phenanthrene	ND	5.00	"							
Phenol	ND	5.00	"							
Pyrene	ND	5.00	"							
1,2,4-Trichlorobenzene	ND	5.00	"							
2,4,5-Trichlorophenol	ND	5.00	"							
2,4,6-Trichlorophenol	ND	5.00	"							
Surr: 2-Fluorobiphenyl	*21.0*		"	*75.0*		*28.0*	*26-135*			
Surr: 2-Fluorophenol	*60.1*		"	*150*		*40.1*	*6-124*			
Surr: Nitrobenzene-d5	*35.7*		"	*75.0*		*47.6*	*23-147*			
Surr: Phenol-d6	*38.0*		"	*150*		*25.3*	*11-130*			
Surr: p-Terphenyl-d14	*51.7*		"	*75.0*		*68.9*	*38-149*			
Surr: 2,4,6-Tribromophenol	*138*		"	*150*		*92.0*	*19-126*			

North Creek Analytical - Portland

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Lisa Domenighini, Project Manager

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100188 - EPA 3510/600 Series										
LCS (1100188-BS1)				Prepared: 10/04/01 Analyzed: 10/11/01						
Acenaphthene	53.6	5.00	ug/l	75.0		71.5	40-110			
4-Chloro-3-methylphenol	147	5.00	"	150		98.0	40-110			
2-Chlorophenol	137	5.00	"	150		91.3	40-110			
1,4-Dichlorobenzene	20.6	5.00	"	75.0		27.5	20-90			
2,4-Dinitrotoluene	82.6	5.00	"	75.0		110	50-110			
4-Nitrophenol	58.4	25.0	"	150		38.9	15-100			
N-Nitrosodi-n-propylamine	56.8	10.0	"	75.0		75.7	40-110			
Pentachlorophenol	149	10.0	"	150		99.3	30-120			
Phenol	45.6	5.00	"	150		30.4	15-110			
Pyrene	77.6	5.00	"	75.0		103	40-110			
1,2,4-Trichlorobenzene	22.2	5.00	"	75.0		29.6	25-100			
Surr: 2-Fluorobiphenyl	*31.6*		"	*75.0*		*42.1*	*26-135*			
Surr: 2-Fluorophenol	*77.5*		"	*150*		*51.7*	*6-124*			
Surr: Nitrobenzene-d5	*63.1*		"	*75.0*		*84.1*	*23-147*			
Surr: Phenol-d6	*47.7*		"	*150*		*31.8*	*11-130*			
Surr: p-Terphenyl-d14	*86.3*		"	*75.0*		*115*	*38-149*			
Surr: 2,4,6-Tribromophenol	*188*		"	*150*		*125*	*19-126*			
LCS Dup (1100188-BSD1)				Prepared: 10/04/01 Analyzed: 10/10/01						
Acenaphthene	46.2	5.00	ug/l	75.0		61.6	40-110	14.8	36	
4-Chloro-3-methylphenol	113	5.00	"	150		75.3	40-110	26.2	43	
2-Chlorophenol	103	5.00	"	150		68.7	40-110	28.3	38	
1,4-Dichlorobenzene	21.7	5.00	"	75.0		28.9	20-90	5.20	43	
2,4-Dinitrotoluene	64.7	5.00	"	75.0		86.3	50-110	24.3	31	
4-Nitrophenol	47.3	25.0	"	150		31.5	15-100	21.0	36	
N-Nitrosodi-n-propylamine	49.9	10.0	"	75.0		66.5	40-110	12.9	37	
Pentachlorophenol	124	10.0	"	150		82.7	30-120	18.3	40	
Phenol	35.0	5.00	"	150		23.3	15-110	26.3	36	
Pyrene	66.4	5.00	"	75.0		88.5	40-110	15.6	31	
1,2,4-Trichlorobenzene	25.0	5.00	"	75.0		33.3	25-100	11.9	42	
Surr: 2-Fluorobiphenyl	*26.7*		"	*75.0*		*35.6*	*26-135*			
Surr: 2-Fluorophenol	*56.5*		"	*150*		*37.7*	*6-124*			
Surr: Nitrobenzene-d5	*53.0*		"	*75.0*		*70.7*	*23-147*			
Surr: Phenol-d6	*36.4*		"	*150*		*24.3*	*11-130*			
Surr: p-Terphenyl-d14	*73.2*		"	*75.0*		*97.6*	*38-149*			
Surr: 2,4,6-Tribromophenol	*143*		"	*150*		*95.3*	*19-126*			

North Creek Analytical - Portland

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Lisa Domenighini, Project Manager

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Batch 1100188 - EPA 3510/600 Series

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100208 - EPA 3520/600 Series										
Blank (1100208-BLK1)				Prepared: 10/04/01 Analyzed: 10/09/01						
Acenaphthene	ND	0.100	ug/l							
Acenaphthylene	ND	0.100	"							
Anthracene	ND	0.100	"							
Benzo (a) anthracene	ND	0.100	"							
Benzo (a) pyrene	ND	0.100	"							
Benzo (b) fluoranthene	ND	0.100	"							
Benzo (ghi) perylene	ND	0.100	"							
Benzo (k) fluoranthene	ND	0.100	"							
Chrysene	ND	0.100	"							
Dibenzo (a,h) anthracene	ND	0.200	"							
Fluoranthene	ND	0.100	"							
Fluorene	ND	0.100	"							
Indeno (1,2,3-cd) pyrene	ND	0.100	"							
Naphthalene	ND	0.100	"							
Phenanthrene	ND	0.100	"							
Pyrene	ND	0.100	"							
Surr: Fluorene-d10	*1.43*		"	*2.50*		*57.2*	*25-105*			
Surr: Pyrene-d10	*1.94*		"	*2.50*		*77.6*	*30-130*			
Surr: Benzo (a) pyrene-d12	*1.21*		"	*2.50*		*48.4*	*22-120*			
LCS (1100208-BS1)				Prepared: 10/04/01 Analyzed: 10/08/01						
Acenaphthene	1.86	0.100	ug/l	2.50		74.4	26-135			
Benzo (a) pyrene	1.86	0.100	"	2.50		74.4	38-137			
Pyrene	1.99	0.100	"	2.50		79.6	33-133			
Surr: Fluorene-d10	*1.63*		"	*2.50*		*65.2*	*25-105*			
Surr: Pyrene-d10	*2.09*		"	*2.50*		*83.6*	*30-130*			
Surr: Benzo (a) pyrene-d12	*1.38*		"	*2.50*		*55.2*	*22-120*			

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100208 - EPA 3520/600 Series										
LCS Dup (1100208-BSD1)				Prepared: 10/04/01 Analyzed: 10/08/01						
Acenaphthene	2.31	0.100	ug/l	2.50		92.4	26-135	21.6	60	
Benzo (a) pyrene	2.17	0.100	"	2.50		86.8	38-137	15.4	60	
Pyrene	2.45	0.100	"	2.50		98.0	33-133	20.7	60	
Surr: Fluorene-d10	*1.90*		"	*2.50*		*76.0*	*25-105*			
Surr: Pyrene-d10	*2.45*		"	*2.50*		*98.0*	*30-130*			
Surr: Benzo (a) pyrene-d12	*1.52*		"	*2.50*		*60.8*	*22-120*			

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Conventional Chemistry Parameters per APHA/EPA Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100243 - Wet Chem										
Blank (1100243-BLK1)				Prepared: 10/05/01 Analyzed: 10/09/01						
Total Suspended Solids	ND	1.00	mg/l							
LCS (1100243-BS1)				Prepared: 10/05/01 Analyzed: 10/09/01						
Total Suspended Solids	58.0	10.0	mg/l	60.0		96.7	80-120			
Duplicate (1100243-DUP1)		Source: P1J0139-02		Prepared: 10/05/01 Analyzed: 10/09/01						
Total Suspended Solids	ND	10.0	mg/l		ND				20	

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-010928	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/18/01 11:13

Notes and Definitions

Q-06	Analyses are not controlled on RPD values from sample concentrations less than 5 times the reporting limit.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis. MRLs are adjusted if %Solids are less than 50%.
wet	Sample results reported on a wet weight basis (as received)
RPD	Relative Percent Difference

North Creek Analytical - Portland

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Lisa Domenighini, Project Manager

PIJ0097

HAHN AND ASSOCIATES, INC.
Environmental Management
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: NCA
Lab Project No.:

CHAIN OF CUSTODY
Chain of Custody No. 2

Project Manager	Gary Lantz
Project No.	5106
Project Name	T1S
Collected by	Matt Mudge

Liquid with Sediment Sample
____ Test Filtrate ____ Test Sediment ____ Test Both
Multi-Phase Sample
____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N)	
Appropriate Containers Used (Y or N)	
Provide Verbal Results (Y or N)	No
Provide Preliminary Fax Results	YES

Sample Number Prefix: 5106-01001-

Bill Port of Portland

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Water	Other	Number of Containers	EPA 8260 B (VOCs)	NW TPH-Dx	EPA 8270 SIM (cPAHs)	EPA 8270 (DEHP)	EPA 6010 As,Cu,Pb (FILTERED)	EPA 6010 As,Cu,Pb (UNFILTERED)	EPA 6010 Ag,Cr,Hg,Ni,Zn (UNFILTERED)	EPA 160.1 (TSS)	RUSH	Remarks
	106	10/01/01	9:03	MW-7		X		5			*	*	*	*		*		
	107		10:38	MW-2		X		5			*	*	*	*		*		
	108		12:18	MW-1		X		9	*	*	*	*	*	*	*	*		
	109		12:20	MW-1 DUP		X		9	*	*	*	*	*	*	*	*		
	110		13:25	Equip. Blank		X		4	*			*						

Relinquished by: M.S. Mudge	Company: HAHN & ASSOC	Date: 10/2/01	Time: 1325	Received by:	Company: NCA	
Relinquished by:	Company: NCA	Date: 10 2 01	Time: 1550	Received by: K	Company: NCA	

2.6°C

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Hahn and Associates, Inc.	Project: TI South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	Reported:
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
5106-011001-106	P1J0097-01	Water	10/01/01 09:03	10/02/01 16:05
5106-011001-107	P1J0097-02	Water	10/01/01 10:38	10/02/01 16:05
5106-011001-108	P1J0097-03	Water	10/01/01 12:18	10/02/01 16:05
5106-011001-109	P1J0097-04	Water	10/01/01 12:20	10/02/01 16:05
5106-011001-110	P1J0097-05	Water	10/01/01 13:25	10/02/01 16:05

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-108 (P1J0097-03) Water					Sampled: 10/01/01 Received: 10/02/01				
Diesel Range Organics	**0.416**	0.250	mg/l	1	NWTPH-Dx	10/03/01	10/04/01	1100139	D-15
Heavy Oil Range Hydrocarbons	ND	0.500	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	*99.3 %*	*50-150*							
5106-011001-109 (P1J0097-04) Water					Sampled: 10/01/01 Received: 10/02/01				
Diesel Range Organics	**0.338**	0.250	mg/l	1	NWTPH-Dx	10/03/01	10/04/01	1100139	D-15
Heavy Oil Range Hydrocarbons	ND	0.500	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	*98.5 %*	*50-150*							

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-106 (P1J0097-01) Water					Sampled: 10/01/01 Received: 10/02/01				
Arsenic	**0.00138**	0.00100	mg/l	1	EPA 6020	10/10/01	10/11/01	1100451	
Copper	ND	0.00200	"	"	"	"	"	"	
Lead	**0.00447**	0.00100	"	"	"	"	"	"	
5106-011001-107 (P1J0097-02) Water					Sampled: 10/01/01 Received: 10/02/01				
Arsenic	**0.0128**	0.00100	mg/l	1	EPA 6020	10/10/01	10/11/01	1100451	
Copper	ND	0.00200	"	"	"	"	"	"	
Lead	ND	0.00100	"	"	"	"	"	"	
5106-011001-108 (P1J0097-03) Water					Sampled: 10/01/01 Received: 10/02/01				
Arsenic	**0.00201**	0.00100	mg/l	1	EPA 6020	10/10/01	10/11/01	1100451	
Cadmium	ND	0.00100	"	"	"	"	"	"	
Chromium	**0.00325**	0.00100	"	"	"	"	"	"	
Copper	**0.00474**	0.00200	"	"	"	"	"	"	
Lead	**0.00116**	0.00100	"	"	"	"	"	"	
Mercury	ND	0.000200	"	"	EPA 7470A	10/11/01	10/12/01	1100490	
Nickel	**0.00525**	0.00200	"	"	EPA 6020	10/10/01	10/11/01	1100451	
Silver	ND	0.00100	"	"	"	"	"	"	
Zinc	**0.0106**	0.00500	"	"	"	"	"	"	
5106-011001-109 (P1J0097-04) Water					Sampled: 10/01/01 Received: 10/02/01				
Arsenic	**0.00106**	0.00100	mg/l	1	EPA 6020	10/10/01	10/11/01	1100451	
Cadmium	ND	0.00100	"	"	"	"	"	"	
Chromium	**0.00265**	0.00100	"	"	"	"	"	"	
Copper	**0.00388**	0.00200	"	"	"	"	"	"	
Lead	ND	0.00100	"	"	"	"	"	"	
Mercury	ND	0.000200	"	"	EPA 7470A	10/11/01	10/12/01	1100490	
Nickel	**0.00449**	0.00200	"	"	EPA 6020	10/10/01	10/11/01	1100451	
Silver	ND	0.00100	"	"	"	"	"	"	
Zinc	**0.00843**	0.00500	"	"	"	"	"	"	

North Creek Analytical - Portland

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Lisa Domenighini, Project Manager

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Dissolved Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-106 (P1J0097-01) Water					Sampled: 10/01/01 Received: 10/02/01				
Arsenic	ND	0.00100	mg/l	1	EPA 6020	10/12/01	10/16/01	1100551	
Copper	ND	0.00200	"	"	"	"	"	"	
Lead	ND	0.00100	"	"	"	"	"	"	
5106-011001-107 (P1J0097-02) Water					Sampled: 10/01/01 Received: 10/02/01				
Arsenic	**0.0145**	0.00100	mg/l	1	EPA 6020	10/12/01	10/16/01	1100551	
Copper	ND	0.00200	"	"	"	"	"	"	
Lead	ND	0.00100	"	"	"	"	"	"	
5106-011001-108 (P1J0097-03) Water					Sampled: 10/01/01 Received: 10/02/01				
Arsenic	ND	0.00100	mg/l	1	EPA 6020	10/12/01	10/16/01	1100551	
Copper	**0.00229**	0.00200	"	"	"	"	"	"	
Lead	**0.00137**	0.00100	"	"	"	"	"	"	
5106-011001-109 (P1J0097-04) Water					Sampled: 10/01/01 Received: 10/02/01				
Arsenic	ND	0.00100	mg/l	1	EPA 6020	10/12/01	10/16/01	1100551	
Copper	**0.00203**	0.00200	"	"	"	"	"	"	
Lead	ND	0.00100	"	"	"	"	"	"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-108 (P1J0097-03) Water					Sampled: 10/01/01 Received: 10/02/01				
Acetone	ND	25.0	ug/l	1	EPA 8260B	10/04/01	10/04/01	1100190	
Benzene	ND	1.00	"	"	"	"	"	"	
Bromobenzene	ND	1.00	"	"	"	"	"	"	
Bromochloromethane	ND	1.00	"	"	"	"	"	"	
Bromodichloromethane	ND	1.00	"	"	"	"	"	"	
Bromoform	ND	1.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.00	"	"	"	"	"	"	
sec-Butylbenzene	ND	1.00	"	"	"	"	"	"	
tert-Butylbenzene	ND	1.00	"	"	"	"	"	"	
Carbon disulfide	ND	10.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.00	"	"	"	"	"	"	
Chlorobenzene	ND	1.00	"	"	"	"	"	"	
Chloroethane	ND	1.00	"	"	"	"	"	"	
Chloroform	ND	1.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
2-Chlorotoluene	ND	1.00	"	"	"	"	"	"	
4-Chlorotoluene	ND	1.00	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	1.00	"	"	"	"	"	"	
1,2-Dibromoethane	ND	1.00	"	"	"	"	"	"	
Dibromomethane	ND	1.00	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.00	"	"	"	"	"	"	
1,3-Dichloropropane	ND	1.00	"	"	"	"	"	"	
2,2-Dichloropropane	ND	1.00	"	"	"	"	"	"	
1,1-Dichloropropene	ND	1.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	1.00	"	"	"	"	"	"	
Ethylbenzene	ND	1.00	"	"	"	"	"	"	

North Creek Analytical - Portland

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Lisa Domenighini, Project Manager

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Hahn and Associates, Inc.	Project: TI South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-108 (P1J0097-03) Water					Sampled: 10/01/01 Received: 10/02/01				
Hexachlorobutadiene	ND	2.00	ug/l	1	EPA 8260B	10/04/01	10/04/01	1100190	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
Isopropylbenzene	ND	2.00	"	"	"	"	"	"	
p-Isopropyltoluene	ND	2.00	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	5.00	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	1.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
Naphthalene	ND	2.00	"	"	"	"	"	"	
n-Propylbenzene	ND	1.00	"	"	"	"	"	"	
Styrene	ND	1.00	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	1.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.00	"	"	"	"	"	"	
Tetrachloroethene	**2.76**	1.00	"	"	"	"	"	"	
Toluene	ND	1.00	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.00	"	"	"	"	"	"	
Trichloroethene	ND	1.00	"	"	"	"	"	"	
Trichlorofluoromethane	ND	1.00	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	1.00	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.00	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.00	"	"	"	"	"	"	
Vinyl chloride	ND	1.00	"	"	"	"	"	"	
o-Xylene	ND	1.00	"	"	"	"	"	"	
m,p-Xylene	ND	2.00	"	"	"	"	"	"	
Surr: 4-BFB	*112 %*	*75-125*							
Surr: 1,2-DCA-d4	*104 %*	*75-125*							
Surr: Dibromofluoromethane	*106 %*	*75-125*							
Surr: Toluene-d8	*104 %*	*75-125*							

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-109 (P1J0097-04) Water					Sampled: 10/01/01 Received: 10/02/01				
Acetone	ND	25.0	ug/l	1	EPA 8260B	10/04/01	10/04/01	1100190	
Benzene	ND	1.00	"	"	"	"	"	"	
Bromobenzene	ND	1.00	"	"	"	"	"	"	
Bromochloromethane	ND	1.00	"	"	"	"	"	"	
Bromodichloromethane	ND	1.00	"	"	"	"	"	"	
Bromoform	ND	1.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.00	"	"	"	"	"	"	
sec-Butylbenzene	ND	1.00	"	"	"	"	"	"	
tert-Butylbenzene	ND	1.00	"	"	"	"	"	"	
Carbon disulfide	ND	10.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.00	"	"	"	"	"	"	
Chlorobenzene	ND	1.00	"	"	"	"	"	"	
Chloroethane	ND	1.00	"	"	"	"	"	"	
Chloroform	ND	1.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
2-Chlorotoluene	ND	1.00	"	"	"	"	"	"	
4-Chlorotoluene	ND	1.00	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	1.00	"	"	"	"	"	"	
1,2-Dibromoethane	ND	1.00	"	"	"	"	"	"	
Dibromomethane	ND	1.00	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.00	"	"	"	"	"	"	
1,3-Dichloropropane	ND	1.00	"	"	"	"	"	"	
2,2-Dichloropropane	ND	1.00	"	"	"	"	"	"	
1,1-Dichloropropene	ND	1.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	1.00	"	"	"	"	"	"	
Ethylbenzene	ND	1.00	"	"	"	"	"	"	

North Creek Analytical - Portland

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Lisa Domenighini, Project Manager

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-109 (P1J0097-04) Water					Sampled: 10/01/01 Received: 10/02/01				
Hexachlorobutadiene	ND	2.00	ug/l	1	EPA 8260B	10/04/01	10/04/01	1100190	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
Isopropylbenzene	ND	2.00	"	"	"	"	"	"	
p-Isopropyltoluene	ND	2.00	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	5.00	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	1.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
Naphthalene	ND	2.00	"	"	"	"	"	"	
n-Propylbenzene	ND	1.00	"	"	"	"	"	"	
Styrene	ND	1.00	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	1.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.00	"	"	"	"	"	"	
Tetrachloroethene	**3.29**	1.00	"	"	"	"	"	"	
Toluene	ND	1.00	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.00	"	"	"	"	"	"	
Trichloroethene	ND	1.00	"	"	"	"	"	"	
Trichlorofluoromethane	ND	1.00	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	1.00	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.00	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.00	"	"	"	"	"	"	
Vinyl chloride	ND	1.00	"	"	"	"	"	"	
o-Xylene	ND	1.00	"	"	"	"	"	"	
m,p-Xylene	ND	2.00	"	"	"	"	"	"	
Surr: 4-BFB	*114 %*	*75-125*							
Surr: 1,2-DCA-d4	*110 %*	*75-125*							
Surr: Dibromofluoromethane	*110 %*	*75-125*							
Surr: Toluene-d8	*106 %*	*75-125*							

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-110 (P1J0097-05) Water					Sampled: 10/01/01 Received: 10/02/01				
Acetone	ND	25.0	ug/l	1	EPA 8260B	10/04/01	10/04/01	1100190	
Benzene	ND	1.00	"	"	"	"	"	"	
Bromobenzene	ND	1.00	"	"	"	"	"	"	
Bromochloromethane	ND	1.00	"	"	"	"	"	"	
Bromodichloromethane	ND	1.00	"	"	"	"	"	"	
Bromoform	ND	1.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.00	"	"	"	"	"	"	
sec-Butylbenzene	ND	1.00	"	"	"	"	"	"	
tert-Butylbenzene	ND	1.00	"	"	"	"	"	"	
Carbon disulfide	ND	10.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.00	"	"	"	"	"	"	
Chlorobenzene	ND	1.00	"	"	"	"	"	"	
Chloroethane	ND	1.00	"	"	"	"	"	"	
Chloroform	ND	1.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
2-Chlorotoluene	ND	1.00	"	"	"	"	"	"	
4-Chlorotoluene	ND	1.00	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	1.00	"	"	"	"	"	"	
1,2-Dibromoethane	ND	1.00	"	"	"	"	"	"	
Dibromomethane	ND	1.00	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.00	"	"	"	"	"	"	
1,3-Dichloropropane	ND	1.00	"	"	"	"	"	"	
2,2-Dichloropropane	ND	1.00	"	"	"	"	"	"	
1,1-Dichloropropene	ND	1.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	1.00	"	"	"	"	"	"	
Ethylbenzene	ND	1.00	"	"	"	"	"	"	

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-110 (P1J0097-05) Water					Sampled: 10/01/01 Received: 10/02/01				
Hexachlorobutadiene	ND	2.00	ug/l	1	EPA 8260B	10/04/01	10/04/01	1100190	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
Isopropylbenzene	ND	2.00	"	"	"	"	"	"	
p-Isopropyltoluene	ND	2.00	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	5.00	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	1.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
Naphthalene	ND	2.00	"	"	"	"	"	"	
n-Propylbenzene	ND	1.00	"	"	"	"	"	"	
Styrene	ND	1.00	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	1.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.00	"	"	"	"	"	"	
Tetrachloroethene	ND	1.00	"	"	"	"	"	"	
Toluene	ND	1.00	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.00	"	"	"	"	"	"	
Trichloroethene	ND	1.00	"	"	"	"	"	"	
Trichlorofluoromethane	ND	1.00	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	1.00	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.00	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.00	"	"	"	"	"	"	
Vinyl chloride	ND	1.00	"	"	"	"	"	"	
o-Xylene	ND	1.00	"	"	"	"	"	"	
m,p-Xylene	ND	2.00	"	"	"	"	"	"	
Surr: 4-BFB	*111 %*	*75-125*							
Surr: 1,2-DCA-d4	*112 %*	*75-125*							
Surr: Dibromofluoromethane	*104 %*	*75-125*							
Surr: Toluene-d8	*106 %*	*75-125*							

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-106 (P1J0097-01) Water						Sampled: 10/01/01	Received: 10/02/01		
Bis(2-ethylhexyl)phthalate	ND	10.0	ug/l	1	EPA 8270C	10/04/01	10/11/01	1100188	
Surr: 2-Fluorobiphenyl	*64.8 %*	*26-135*							
Surr: Nitrobenzene-d5	*91.9 %*	*23-147*							
Surr: p-Terphenyl-d14	*122 %*	*38-149*							
5106-011001-107 (P1J0097-02) Water						Sampled: 10/01/01	Received: 10/02/01		
Bis(2-ethylhexyl)phthalate	ND	10.0	ug/l	1	EPA 8270C	10/04/01	10/10/01	1100188	
Surr: 2-Fluorobiphenyl	*65.8 %*	*26-135*							
Surr: Nitrobenzene-d5	*82.5 %*	*23-147*							
Surr: p-Terphenyl-d14	*116 %*	*38-149*							
5106-011001-108 (P1J0097-03) Water						Sampled: 10/01/01	Received: 10/02/01		
Bis(2-ethylhexyl)phthalate	ND	10.0	ug/l	1	EPA 8270C	10/04/01	10/11/01	1100188	
Surr: 2-Fluorobiphenyl	*58.4 %*	*26-135*							
Surr: Nitrobenzene-d5	*79.8 %*	*23-147*							
Surr: p-Terphenyl-d14	*110 %*	*38-149*							
5106-011001-109 (P1J0097-04) Water						Sampled: 10/01/01	Received: 10/02/01		
Bis(2-ethylhexyl)phthalate	ND	10.0	ug/l	1	EPA 8270C	10/04/01	10/11/01	1100188	
Surr: 2-Fluorobiphenyl	*67.4 %*	*26-135*							
Surr: Nitrobenzene-d5	*79.7 %*	*23-147*							
Surr: p-Terphenyl-d14	*119 %*	*38-149*							
5106-011001-110 (P1J0097-05) Water						Sampled: 10/01/01	Received: 10/02/01		
Bis(2-ethylhexyl)phthalate	ND	10.0	ug/l	1	EPA 8270C	10/04/01	10/10/01	1100188	
Surr: 2-Fluorobiphenyl	*52.5 %*	*26-135*							
Surr: Nitrobenzene-d5	*71.4 %*	*23-147*							
Surr: p-Terphenyl-d14	*108 %*	*38-149*							

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-106 (P1J0097-01) Water					Sampled: 10/01/01 Received: 10/02/01				
Acenaphthene	ND	0.100	ug/l	1	EPA 8270m	10/04/01	10/08/01	1100208	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Fluoranthene	ND	0.100	"	"	"	"	"	"	
Fluorene	ND	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	ND	0.100	"	"	"	"	"	"	
Phenanthrene	**0.153**	0.100	"	"	"	"	"	"	
Pyrene	**0.153**	0.100	"	"	"	"	"	"	
Surr: Fluorene-d10	*70.0 %*	*25-105*							
Surr: Pyrene-d10	*91.7 %*	*30-130*							
Surr: Benzo (a) pyrene-d12	*57.9 %*	*22-120*							
5106-011001-107 (P1J0097-02) Water					Sampled: 10/01/01 Received: 10/02/01				
Acenaphthene	**0.121**	0.100	ug/l	1	EPA 8270m	10/04/01	10/08/01	1100208	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Fluoranthene	**0.119**	0.100	"	"	"	"	"	"	
Fluorene	ND	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	ND	0.100	"	"	"	"	"	"	
Phenanthrene	**1.25**	0.100	"	"	"	"	"	"	
Pyrene	**0.564**	0.100	"	"	"	"	"	"	
Surr: Fluorene-d10	*62.7 %*	*25-105*							

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-107 (P1J0097-02) Water					Sampled: 10/01/01 Received: 10/02/01				
Surr: Pyrene-d10	*82.6 %*	*30-130*							
Surr: Benzo (a) pyrene-d12	*47.9 %*	*22-120*							
5106-011001-108 (P1J0097-03) Water					Sampled: 10/01/01 Received: 10/02/01				
Acenaphthene	ND	0.100	ug/l	1	EPA 8270m	10/04/01	10/08/01	1100208	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Fluoranthene	ND	0.100	"	"	"	"	"	"	
Fluorene	ND	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	ND	0.100	"	"	"	"	"	"	
Phenanthrene	ND	0.100	"	"	"	"	"	"	
Pyrene	ND	0.100	"	"	"	"	"	"	
Surr: Fluorene-d10	*71.4 %*	*25-105*							
Surr: Pyrene-d10	*103 %*	*30-130*							
Surr: Benzo (a) pyrene-d12	*66.0 %*	*22-120*							
5106-011001-109 (P1J0097-04) Water					Sampled: 10/01/01 Received: 10/02/01				
Acenaphthene	ND	0.100	ug/l	1	EPA 8270m	10/04/01	10/08/01	1100208	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Fluoranthene	ND	0.100	"	"	"	"	"	"	
Fluorene	ND	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	

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434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-109 (P1J0097-04) Water					Sampled: 10/01/01 Received: 10/02/01				
Naphthalene	ND	0.100	ug/l	1	EPA 8270m	10/04/01	10/08/01	1100208	
Phenanthrene	ND	0.100	"	"	"	"	"	"	
Pyrene	ND	0.100	"	"	"	"	"	"	
Surr: Fluorene-d10	*122 %*	*25-105*							*A-10,S-08*
Surr: Pyrene-d10	*175 %*	*30-130*							*A-10,S-08*
Surr: Benzo (a) pyrene-d12	*114 %*	*22-120*							*A-10*

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Conventional Chemistry Parameters per APHA/EPA Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
5106-011001-106 (P1J0097-01) Water					Sampled: 10/01/01 Received: 10/02/01				
Total Suspended Solids	ND	20.0	mg/l	1	EPA 160.2	10/05/01	10/09/01	1100243	
5106-011001-107 (P1J0097-02) Water					Sampled: 10/01/01 Received: 10/02/01				
Total Suspended Solids	**55.0**	50.0	mg/l	1	EPA 160.2	10/05/01	10/09/01	1100243	
5106-011001-108 (P1J0097-03) Water					Sampled: 10/01/01 Received: 10/02/01				
Total Suspended Solids	**36.0**	10.0	mg/l	1	EPA 160.2	10/05/01	10/09/01	1100243	
5106-011001-109 (P1J0097-04) Water					Sampled: 10/01/01 Received: 10/02/01				
Total Suspended Solids	**35.0**	10.0	mg/l	1	EPA 160.2	10/05/01	10/09/01	1100243	

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100139 - EPA 3510 Fuels										
Blank (1100139-BLK1)				Prepared & Analyzed: 10/03/01						
Diesel Range Organics	ND	0.250	mg/l							
Heavy Oil Range Hydrocarbons	ND	0.500	"							
Surr: 1-Chlorooctadecane	*0.0851*		"	*0.0960*		*88.6*	*50-150*			
LCS (1100139-BS1)				Prepared & Analyzed: 10/03/01						
Diesel Range Organics	2.51	0.250	mg/l	2.58		97.3	50-150			
Heavy Oil Range Hydrocarbons	1.65	0.500	"	1.58		104	50-150			
Surr: 1-Chlorooctadecane	*0.0923*		"	*0.0960*		*96.1*	*50-150*			
LCS Dup (1100139-BSD1)				Prepared & Analyzed: 10/03/01						
Diesel Range Organics	2.49	0.250	mg/l	2.58		96.5	50-150	0.800	50	
Heavy Oil Range Hydrocarbons	1.69	0.500	"	1.58		107	50-150	2.40	50	
Surr: 1-Chlorooctadecane	*0.0911*		"	*0.0960*		*94.9*	*50-150*			

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100451 - EPA 200/3005										
Blank (1100451-BLK1)				Prepared: 10/10/01 Analyzed: 10/11/01						
Arsenic	ND	0.00100	mg/l							
Cadmium	ND	0.00100	"							
Chromium	ND	0.00100	"							
Copper	ND	0.00200	"							
Lead	ND	0.00100	"							
Nickel	ND	0.00200	"							
Silver	ND	0.00100	"							
Zinc	ND	0.00500	"							
LCS (1100451-BS1)				Prepared: 10/10/01 Analyzed: 10/11/01						
Arsenic	0.104	0.00100	mg/l	0.100		104	80-120			
Cadmium	0.104	0.00100	"	0.100		104	80-120			
Chromium	0.103	0.00100	"	0.100		103	80-120			
Copper	0.103	0.00200	"	0.100		103	80-120			
Lead	0.104	0.00100	"	0.100		104	80-120			
Nickel	0.102	0.00200	"	0.100		102	80-120			
Silver	0.0497	0.00100	"	0.0500		99.4	80-120			
Zinc	0.106	0.00500	"	0.100		106	80-120			
Duplicate (1100451-DUP1)		**Source: P1J0097-03**		Prepared: 10/10/01 Analyzed: 10/11/01						
Arsenic	0.00222	0.00100	mg/l		0.00201			9.93	20	
Cadmium	ND	0.00100	"		ND				20	
Chromium	0.00294	0.00100	"		0.00325			10.0	20	
Copper	0.00415	0.00200	"		0.00474			13.3	20	
Lead	0.00102	0.00100	"		0.00116			12.8	20	
Nickel	0.00502	0.00200	"		0.00525			4.48	20	
Silver	ND	0.00100	"		ND				20	
Zinc	0.00914	0.00500	"		0.0106			14.8	20	

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100451 - EPA 200/3005										
Matrix Spike (1100451-MS1)		**Source: P1J0097-03**		Prepared: 10/10/01		Analyzed: 10/11/01				
Arsenic	0.0929	0.00870	mg/l	0.100	ND	90.9	75-125			
Cadmium	0.0931	0.00870	"	0.100	ND	93.0	75-125			
Chromium	0.112	0.00100	"	0.100	0.00325	109	75-125			
Copper	0.111	0.00200	"	0.100	0.00474	106	75-125			
Lead	0.109	0.00100	"	0.100	0.00116	108	75-125			
Nickel	0.109	0.00200	"	0.100	0.00525	104	75-125			
Silver	0.0519	0.00100	"	0.0500	ND	103	75-125			
Zinc	0.116	0.00500	"	0.100	0.0106	105	75-125			
Matrix Spike (1100451-MS2)		**Source: P1J0097-04**		Prepared: 10/10/01		Analyzed: 10/11/01				
Arsenic	0.104	0.00100	mg/l	0.100	0.00106	103	75-125			
Cadmium	0.102	0.00100	"	0.100	ND	102	75-125			
Chromium	0.102	0.00100	"	0.100	0.00265	99.4	75-125			
Copper	0.101	0.00200	"	0.100	0.00388	97.1	75-125			
Lead	0.0995	0.00100	"	0.100	ND	98.5	75-125			
Nickel	0.101	0.00200	"	0.100	0.00449	96.5	75-125			
Silver	0.0480	0.00100	"	0.0500	ND	95.6	75-125			
Zinc	0.106	0.00500	"	0.100	0.00843	97.6	75-125			
Batch 1100490 - EPA 7470										
Blank (1100490-BLK1)				Prepared: 10/11/01		Analyzed: 10/12/01				
Mercury	ND	0.000200	mg/l							
LCS (1100490-BS1)				Prepared: 10/11/01		Analyzed: 10/12/01				
Mercury	0.00486	0.000200	mg/l	0.00500		97.2	80-120			

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100490 - EPA 7470										
Duplicate (1100490-DUP1)		**Source: P1J0098-04**		Prepared: 10/11/01	Analyzed: 10/12/01					
Mercury	ND	0.000200	mg/l		ND				20	
Matrix Spike (1100490-MS1)		**Source: P1J0098-04**		Prepared: 10/11/01	Analyzed: 10/12/01					
Mercury	0.00487	0.000200	mg/l	0.00500	ND	97.4	75-125			

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Dissolved Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100551 - EPA 200/3005 Diss										
Blank (1100551-BLK1)				Prepared: 10/12/01 Analyzed: 10/16/01						
Arsenic	ND	0.00819	mg/l							
Copper	ND	0.00200	"							
Lead	ND	0.00100	"							
LCS (1100551-BS1)				Prepared: 10/12/01 Analyzed: 10/16/01						
Arsenic	0.102	0.00100	mg/l	0.100		102	80-120			
Copper	0.102	0.00200	"	0.100		102	80-120			
Lead	0.101	0.00100	"	0.100		101	80-120			
Duplicate (1100551-DUP1)	Source: P1J0097-01			Prepared: 10/12/01 Analyzed: 10/16/01						Q-06
Arsenic	ND	0.00100	mg/l		ND			92.1	20	
Copper	ND	0.00200	"		ND			40.0	20	Q-06
Lead	ND	0.00100	"		ND			137	20	Q-06
Matrix Spike (1100551-MS1)	Source: P1J0097-01			Prepared: 10/12/01 Analyzed: 10/16/01						
Arsenic	0.102	0.00100	mg/l	0.100	ND	102	75-125			
Copper	0.0995	0.00200	"	0.100	ND	98.8	75-125			
Lead	0.0978	0.00100	"	0.100	ND	97.6	75-125			
Matrix Spike (1100551-MS2)	Source: P1J0192-01			Prepared: 10/12/01 Analyzed: 10/16/01						
Arsenic	0.102	0.00100	mg/l	0.100	ND	102	75-125			
Copper	0.100	0.00200	"	0.100	ND	99.3	75-125			
Lead	0.0957	0.00100	"	0.100	ND	95.6	75-125			

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100190 - EPA 5030B										
Blank (1100190-BLK1)				Prepared & Analyzed: 10/04/01						
Acetone	ND	25.0	ug/l							
Benzene	ND	1.00	"							
Bromobenzene	ND	1.00	"							
Bromochloromethane	ND	1.00	"							
Bromodichloromethane	ND	1.00	"							
Bromoform	ND	1.00	"							
Bromomethane	ND	5.00	"							
2-Butanone	ND	10.0	"							
n-Butylbenzene	ND	5.00	"							
sec-Butylbenzene	ND	1.00	"							
tert-Butylbenzene	ND	1.00	"							
Carbon disulfide	ND	10.0	"							
Carbon tetrachloride	ND	1.00	"							
Chlorobenzene	ND	1.00	"							
Chloroethane	ND	1.00	"							
Chloroform	ND	1.00	"							
Chloromethane	ND	5.00	"							
2-Chlorotoluene	ND	1.00	"							
4-Chlorotoluene	ND	1.00	"							
1,2-Dibromo-3-chloropropane	ND	5.00	"							
Dibromochloromethane	ND	1.00	"							
1,2-Dibromoethane	ND	1.00	"							
Dibromomethane	ND	1.00	"							
1,2-Dichlorobenzene	ND	1.00	"							
1,3-Dichlorobenzene	ND	1.00	"							
1,4-Dichlorobenzene	ND	1.00	"							
Dichlorodifluoromethane	ND	5.00	"							
1,1-Dichloroethane	ND	1.00	"							
1,2-Dichloroethane	ND	1.00	"							
1,1-Dichloroethene	ND	1.00	"							
cis-1,2-Dichloroethene	ND	1.00	"							
trans-1,2-Dichloroethene	ND	1.00	"							
1,2-Dichloropropane	ND	1.00	"							
1,3-Dichloropropane	ND	1.00	"							
2,2-Dichloropropane	ND	1.00	"							
1,1-Dichloropropene	ND	1.00	"							

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100190 - EPA 5030B										
Blank (1100190-BLK1)				Prepared & Analyzed: 10/04/01						
cis-1,3-Dichloropropene	ND	1.00	ug/l							
trans-1,3-Dichloropropene	ND	1.00	"							
Ethylbenzene	ND	1.00	"							
Hexachlorobutadiene	ND	2.00	"							
2-Hexanone	ND	10.0	"							
Isopropylbenzene	ND	2.00	"							
p-Isopropyltoluene	ND	2.00	"							
4-Methyl-2-pentanone	ND	5.00	"							
Methyl tert-butyl ether	ND	1.00	"							
Methylene chloride	ND	5.00	"							
Naphthalene	ND	2.00	"							
n-Propylbenzene	ND	1.00	"							
Styrene	ND	1.00	"							
1,1,1,2-Tetrachloroethane	ND	1.00	"							
1,1,2,2-Tetrachloroethane	ND	1.00	"							
Tetrachloroethene	ND	1.00	"							
Toluene	ND	1.00	"							
1,2,3-Trichlorobenzene	ND	1.00	"							
1,2,4-Trichlorobenzene	ND	1.00	"							
1,1,1-Trichloroethane	ND	1.00	"							
1,1,2-Trichloroethane	ND	1.00	"							
Trichloroethene	ND	1.00	"							
Trichlorofluoromethane	ND	1.00	"							
1,2,3-Trichloropropane	ND	1.00	"							
1,2,4-Trimethylbenzene	ND	1.00	"							
1,3,5-Trimethylbenzene	ND	1.00	"							
Vinyl chloride	ND	1.00	"							
o-Xylene	ND	1.00	"							
m,p-Xylene	ND	2.00	"							
Surr: 4-BFB	*21.6*		"	*20.0*		*108*	*75-125*			
Surr: 1,2-DCA-d4	*21.6*		"	*20.0*		*108*	*75-125*			
Surr: Dibromofluoromethane	*20.2*		"	*20.0*		*101*	*75-125*			
Surr: Toluene-d8	*20.4*		"	*20.0*		*102*	*75-125*			

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100190 - EPA 5030B										
LCS (1100190-BS1)				Prepared & Analyzed: 10/04/01						
Benzene	20.4	1.00	ug/l	20.0		102	80-125			
Chlorobenzene	23.6	1.00	"	20.0		118	80-125			
1,1-Dichloroethene	19.6	1.00	"	20.0		98.0	70-135			
Toluene	21.8	1.00	"	20.0		109	80-125			
Trichloroethene	19.2	1.00	"	20.0		96.0	70-130			
Surr: 4-BFB	*23.0*		"	*20.0*		*115*	*75-125*			
Surr: 1,2-DCA-d4	*21.6*		"	*20.0*		*108*	*75-125*			
Surr: Dibromofluoromethane	*19.7*		"	*20.0*		*98.5*	*75-125*			
Surr: Toluene-d8	*20.9*		"	*20.0*		*104*	*75-125*			
Matrix Spike (1100190-MS1)	**Source: P1J0057-04**			Prepared & Analyzed: 10/04/01						
Benzene	19.8	1.00	ug/l	20.0	ND	97.7	80-125			
Chlorobenzene	22.3	1.00	"	20.0	ND	112	80-125			
1,1-Dichloroethene	20.0	1.00	"	20.0	ND	100	70-135			
Toluene	21.3	1.00	"	20.0	ND	106	80-125			
Trichloroethene	18.4	1.00	"	20.0	ND	89.0	70-130			
Surr: 4-BFB	*22.5*		"	*20.0*		*112*	*75-125*			
Surr: 1,2-DCA-d4	*20.7*		"	*20.0*		*104*	*75-125*			
Surr: Dibromofluoromethane	*20.8*		"	*20.0*		*104*	*75-125*			
Surr: Toluene-d8	*20.9*		"	*20.0*		*104*	*75-125*			
Matrix Spike Dup (1100190-MSD1)	**Source: P1J0057-04**			Prepared & Analyzed: 10/04/01						
Benzene	20.0	1.00	ug/l	20.0	ND	98.7	80-125	1.01	25	
Chlorobenzene	22.1	1.00	"	20.0	ND	110	80-125	0.901	25	
1,1-Dichloroethene	19.6	1.00	"	20.0	ND	98.0	70-135	2.02	25	
Toluene	21.0	1.00	"	20.0	ND	105	80-125	1.42	25	
Trichloroethene	18.5	1.00	"	20.0	ND	89.4	70-130	0.542	25	
Surr: 4-BFB	*22.4*		"	*20.0*		*112*	*75-125*			
Surr: 1,2-DCA-d4	*21.0*		"	*20.0*		*105*	*75-125*			
Surr: Dibromofluoromethane	*20.5*		"	*20.0*		*102*	*75-125*			
Surr: Toluene-d8	*20.8*		"	*20.0*		*104*	*75-125*			

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Hahn and Associates, Inc.	Project: TI South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100188 - EPA 3510/600 Series										
Blank (1100188-BLK1)				Prepared: 10/04/01 Analyzed: 10/10/01						
Acenaphthene	ND	5.00	ug/l							
Acenaphthylene	ND	5.00	"							
Anthracene	ND	5.00	"							
Benzo (a) anthracene	ND	5.00	"							
Benzo (a) pyrene	ND	5.00	"							
Benzo (b) fluoranthene	ND	5.00	"							
Benzo (ghi) perylene	ND	5.00	"							
Benzo (k) fluoranthene	ND	5.00	"							
Benzoic Acid	ND	50.0	"							
Benzyl alcohol	ND	10.0	"							
4-Bromophenyl phenyl ether	ND	5.00	"							
Butyl benzyl phthalate	ND	5.00	"							
4-Chloro-3-methylphenol	ND	5.00	"							
4-Chloroaniline	ND	20.0	"							
Bis(2-chloroethoxy)methane	ND	10.0	"							
Bis(2-chloroethyl)ether	ND	5.00	"							
Bis(2-chloroisopropyl)ether	ND	10.0	"							
2-Chloronaphthalene	ND	5.00	"							
2-Chlorophenol	ND	5.00	"							
4-Chlorophenyl phenyl ether	ND	5.00	"							
Chrysene	ND	5.00	"							
Di-n-butyl phthalate	ND	5.00	"							
Di-n-octyl phthalate	ND	5.00	"							
Dibenzo (a,h) anthracene	ND	5.00	"							
Dibenzofuran	ND	5.00	"							
1,2-Dichlorobenzene	ND	5.00	"							
1,3-Dichlorobenzene	ND	5.00	"							
1,4-Dichlorobenzene	ND	5.00	"							
3,3'-Dichlorobenzidine	ND	5.00	"							
2,4-Dichlorophenol	ND	5.00	"							
Diethyl phthalate	ND	5.00	"							
2,4-Dimethylphenol	ND	10.0	"							
Dimethyl phthalate	ND	5.00	"							
4,6-Dinitro-2-methylphenol	ND	10.0	"							
2,4-Dinitrophenol	ND	25.0	"							
2,4-Dinitrotoluene	ND	5.00	"							

North Creek Analytical - Portland

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Lisa Domenighini, Project Manager

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100188 - EPA 3510/600 Series										
Blank (1100188-BLK1)				Prepared: 10/04/01 Analyzed: 10/10/01						
2,6-Dinitrotoluene	ND	5.00	ug/l							
Bis(2-ethylhexyl)phthalate	ND	10.0	"							
Fluoranthene	ND	5.00	"							
Fluorene	ND	5.00	"							
Hexachlorobenzene	ND	5.00	"							
Hexachlorobutadiene	ND	10.0	"							
Hexachlorocyclopentadiene	ND	10.0	"							
Hexachloroethane	ND	10.0	"							
Indeno (1,2,3-cd) pyrene	ND	5.00	"							
Isophorone	ND	5.00	"							
2-Methylnaphthalene	ND	5.00	"							
2-Methylphenol	ND	10.0	"							
3-,4-Methylphenol	ND	5.00	"							
Naphthalene	ND	5.00	"							
2-Nitroaniline	ND	5.00	"							
3-Nitroaniline	ND	10.0	"							
4-Nitroaniline	ND	10.0	"							
Nitrobenzene	ND	5.00	"							
2-Nitrophenol	ND	5.00	"							
4-Nitrophenol	ND	25.0	"							
N-Nitrosodi-n-propylamine	ND	10.0	"							
N-Nitrosodiphenylamine	ND	5.00	"							
Pentachlorophenol	ND	10.0	"							
Phenanthrene	ND	5.00	"							
Phenol	ND	5.00	"							
Pyrene	ND	5.00	"							
1,2,4-Trichlorobenzene	ND	5.00	"							
2,4,5-Trichlorophenol	ND	5.00	"							
2,4,6-Trichlorophenol	ND	5.00	"							
Surr: 2-Fluorobiphenyl	*21.0*		"	*75.0*		*28.0*	*26-135*			
Surr: 2-Fluorophenol	*60.1*		"	*150*		*40.1*	*6-124*			
Surr: Nitrobenzene-d5	*35.7*		"	*75.0*		*47.6*	*23-147*			
Surr: Phenol-d6	*38.0*		"	*150*		*25.3*	*11-130*			
Surr: p-Terphenyl-d14	*51.7*		"	*75.0*		*68.9*	*38-149*			
Surr: 2,4,6-Tribromophenol	*138*		"	*150*		*92.0*	*19-126*			

North Creek Analytical - Portland

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Lisa Domenighini, Project Manager

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100188 - EPA 3510/600 Series										
LCS (1100188-BS1)				Prepared: 10/04/01 Analyzed: 10/11/01						
Acenaphthene	53.6	5.00	ug/l	75.0		71.5	40-110			
4-Chloro-3-methylphenol	147	5.00	"	150		98.0	40-110			
2-Chlorophenol	137	5.00	"	150		91.3	40-110			
1,4-Dichlorobenzene	20.6	5.00	"	75.0		27.5	20-90			
2,4-Dinitrotoluene	82.6	5.00	"	75.0		110	50-110			
4-Nitrophenol	58.4	25.0	"	150		38.9	15-100			
N-Nitrosodi-n-propylamine	56.8	10.0	"	75.0		75.7	40-110			
Pentachlorophenol	149	10.0	"	150		99.3	30-120			
Phenol	45.6	5.00	"	150		30.4	15-110			
Pyrene	77.6	5.00	"	75.0		103	40-110			
1,2,4-Trichlorobenzene	22.2	5.00	"	75.0		29.6	25-100			
Surr: 2-Fluorobiphenyl	*31.6*		"	*75.0*		*42.1*	*26-135*			
Surr: 2-Fluorophenol	*77.5*		"	*150*		*51.7*	*6-124*			
Surr: Nitrobenzene-d5	*63.1*		"	*75.0*		*84.1*	*23-147*			
Surr: Phenol-d6	*47.7*		"	*150*		*31.8*	*11-130*			
Surr: p-Terphenyl-d14	*86.3*		"	*75.0*		*115*	*38-149*			
Surr: 2,4,6-Tribromophenol	*188*		"	*150*		*125*	*19-126*			
LCS Dup (1100188-BSD1)				Prepared: 10/04/01 Analyzed: 10/10/01						
Acenaphthene	46.2	5.00	ug/l	75.0		61.6	40-110	14.8	36	
4-Chloro-3-methylphenol	113	5.00	"	150		75.3	40-110	26.2	43	
2-Chlorophenol	103	5.00	"	150		68.7	40-110	28.3	38	
1,4-Dichlorobenzene	21.7	5.00	"	75.0		28.9	20-90	5.20	43	
2,4-Dinitrotoluene	64.7	5.00	"	75.0		86.3	50-110	24.3	31	
4-Nitrophenol	47.3	25.0	"	150		31.5	15-100	21.0	36	
N-Nitrosodi-n-propylamine	49.9	10.0	"	75.0		66.5	40-110	12.9	37	
Pentachlorophenol	124	10.0	"	150		82.7	30-120	18.3	40	
Phenol	35.0	5.00	"	150		23.3	15-110	26.3	36	
Pyrene	66.4	5.00	"	75.0		88.5	40-110	15.6	31	
1,2,4-Trichlorobenzene	25.0	5.00	"	75.0		33.3	25-100	11.9	42	
Surr: 2-Fluorobiphenyl	*26.7*		"	*75.0*		*35.6*	*26-135*			
Surr: 2-Fluorophenol	*56.5*		"	*150*		*37.7*	*6-124*			
Surr: Nitrobenzene-d5	*53.0*		"	*75.0*		*70.7*	*23-147*			
Surr: Phenol-d6	*36.4*		"	*150*		*24.3*	*11-130*			
Surr: p-Terphenyl-d14	*73.2*		"	*75.0*		*97.6*	*38-149*			
Surr: 2,4,6-Tribromophenol	*143*		"	*150*		*95.3*	*19-126*			

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Batch 1100188 - EPA 3510/600 Series

Lisa Domenighini, Project Manager

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100208 - EPA 3520/600 Series										
Blank (1100208-BLK1)				Prepared: 10/04/01 Analyzed: 10/09/01						
Acenaphthene	ND	0.100	ug/l							
Acenaphthylene	ND	0.100	"							
Anthracene	ND	0.100	"							
Benzo (a) anthracene	ND	0.100	"							
Benzo (a) pyrene	ND	0.100	"							
Benzo (b) fluoranthene	ND	0.100	"							
Benzo (ghi) perylene	ND	0.100	"							
Benzo (k) fluoranthene	ND	0.100	"							
Chrysene	ND	0.100	"							
Dibenzo (a,h) anthracene	ND	0.200	"							
Fluoranthene	ND	0.100	"							
Fluorene	ND	0.100	"							
Indeno (1,2,3-cd) pyrene	ND	0.100	"							
Naphthalene	ND	0.100	"							
Phenanthrene	ND	0.100	"							
Pyrene	ND	0.100	"							
Surr: Fluorene-d10	*1.43*		"	*2.50*		*57.2*	*25-105*			
Surr: Pyrene-d10	*1.94*		"	*2.50*		*77.6*	*30-130*			
Surr: Benzo (a) pyrene-d12	*1.21*		"	*2.50*		*48.4*	*22-120*			
LCS (1100208-BS1)				Prepared: 10/04/01 Analyzed: 10/08/01						
Acenaphthene	1.86	0.100	ug/l	2.50		74.4	26-135			
Benzo (a) pyrene	1.86	0.100	"	2.50		74.4	38-137			
Pyrene	1.99	0.100	"	2.50		79.6	33-133			
Surr: Fluorene-d10	*1.63*		"	*2.50*		*65.2*	*25-105*			
Surr: Pyrene-d10	*2.09*		"	*2.50*		*83.6*	*30-130*			
Surr: Benzo (a) pyrene-d12	*1.38*		"	*2.50*		*55.2*	*22-120*			

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100208 - EPA 3520/600 Series										
LCS Dup (1100208-BSD1)				Prepared: 10/04/01 Analyzed: 10/08/01						
Acenaphthene	2.31	0.100	ug/l	2.50		92.4	26-135	21.6	60	
Benzo (a) pyrene	2.17	0.100	"	2.50		86.8	38-137	15.4	60	
Pyrene	2.45	0.100	"	2.50		98.0	33-133	20.7	60	
Surr: Fluorene-d10	*1.90*		"	*2.50*		*76.0*	*25-105*			
Surr: Pyrene-d10	*2.45*		"	*2.50*		*98.0*	*30-130*			
Surr: Benzo (a) pyrene-d12	*1.52*		"	*2.50*		*60.8*	*22-120*			

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Conventional Chemistry Parameters per APHA/EPA Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100243 - Wet Chem										
Blank (1100243-BLK1)				Prepared: 10/05/01 Analyzed: 10/09/01						
Total Suspended Solids	ND	1.00	mg/l							
LCS (1100243-BS1)				Prepared: 10/05/01 Analyzed: 10/09/01						
Total Suspended Solids	58.0	10.0	mg/l	60.0		96.7	80-120			
Duplicate (1100243-DUP1)		Source: P1J0139-02		Prepared: 10/05/01 Analyzed: 10/09/01						
Total Suspended Solids	ND	10.0	mg/l		ND				20	

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Hahn and Associates, Inc.	Project: T1 South	
434 NW Sixth Ave., Suite 203	Project Number: 5106-011001	**Reported:**
Portland, OR 97209	Project Manager: Guy Tanz	10/17/01 15:23

Notes and Definitions

A-10	Suspected double spike of surrogate solution during extraction. Actual recoveries believed to be 1/2 of reported values.
D-15	Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.
Q-06	Analyses are not controlled on RPD values from sample concentrations less than 5 times the reporting limit.
S-08	Surrogate recovery is above control limits. Since no analytes were detected in the sample, the quality of the data has not been affected.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis. MRLs are adjusted if %Solids are less than 50%.
wet	Sample results reported on a wet weight basis (as received)
RPD	Relative Percent Difference

APPENDIX F

Supplemental Water Well Survey Research

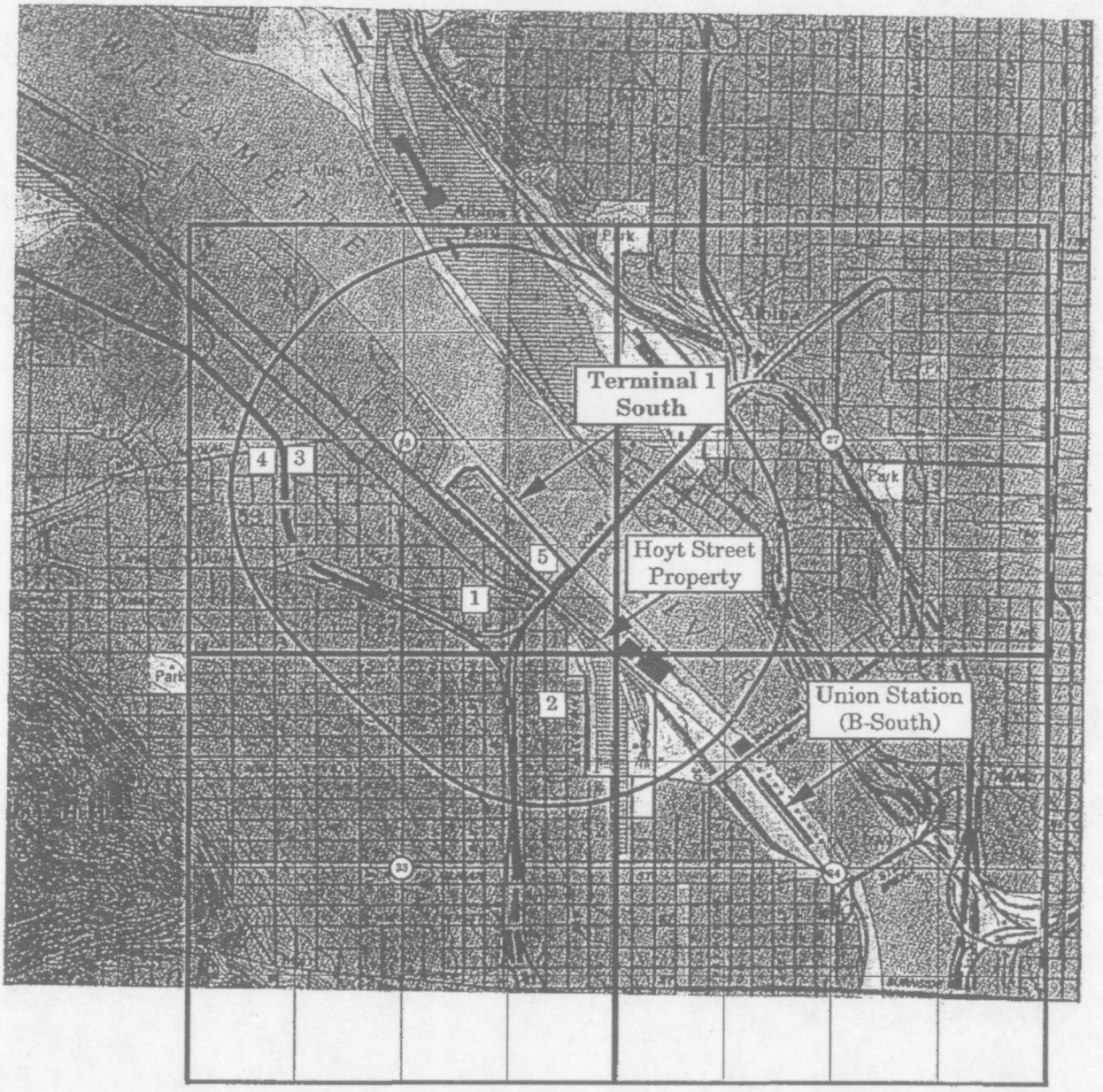
TABLE F1 – Updated Water Well Inventory Summary Table; Township 1N, Range 1E

Monitoring Well Installation and Groundwater Sampling
Port of Portland Terminal 1 South
2100 NW Front Avenue
Portland, Oregon

HAI Project No. 5106

Map No.	OWRD ID	Section	1/4 Section	1/4 1/4 Section	Original Well Owner	Well Address	Current Contact	Title	Company	Contact Response
1	1015	28	SW	SE	PORTLAND ICE AND COLD STORAGE	1810 NW 18TH	Stuart Lindquist	Facilities Manager	Lindquist Development Company	The well location is unknown and has not been used since at least 1992 when the site was re-developed
2	1014	28	SW	SE	BLITZ WEINHARDT CO.	1991 NW UPSHUR	Bruce Boles	Property Owner	-	The well is covered with wood and has not been in use since he purchased the property
3	1013	28	NW	SW	GRIFFITH RUBBER MILLS	2439 NW 22ND	Ron Burr	Facilities Manager	Griffith Rubber Mills	The well is not being used
4	1011	28	SW	NW	A YOUNG AND SON IRON WORKS	2300 NW NICOLAI ST	Ralph Dwyer	Property Owner	-	The well was covered with concrete approximately 12 years ago and is not in use
5	1016	28	SE	SE	COMMISSION OF PUBLIC DOCKS	1884 NW FRONT AVE	Joe Mollusky	Properties and Development	Port of Portland	The referenced well has not been identified at the site and is considered to not be in use
6	1044	33	-	-	ICE COLISEUM	Not Known	-	-	-	No information could be found on this well

POPT1S601625



Note: Base Map from the Portland, Oregon USGS 7.5-Minute Quadrangle, 1990
Contour Interval: 10 Feet

HAI Project No. 5106	**HAHN AND ASSOCIATES** INCORPORATED	**Water Well Location Map**	FIGURE **F1**
November 2001	ENVIRONMENTAL MANAGEMENT 434 NW SIXTH AVENUE, SUITE 203 PORTLAND, OREGON 97209 503/796-0717	Report on Monitoring Well Installation and Groundwater Sampling Marine Terminal 1 South 2100 NW Front Avenue Portland, Oregon	

Additional Beneficial Use Determination Well Research

Well Number 1:

11/15/01

- Called Multnomah County Records Office 503-988-3375 (property ownership and taxation department - ext. 3)
  - 1810 NW 18th Ave. is address listed on well record
    - No such address
  - **1826 NW 18th Ave.** is closest match on county records
    - From aerial (www.mapquest.com) looks like block has only 1 building on it, currently
    - Warehouse built in 1992
    - Owner is **Lindquist Development Company**
      - PO Box 42135, Portland, Oregon, 97242
- Yellow pages (www.qwestdex.com) found "Lindquist Homes"
  2636 NW 26th Ave., Portland, Oregon, 97210 **503-227-8275**
  - Answering service said "Lindquist Development Company"
  - Asked for facilities manager: **Stuart Lindquist**
  - Left message 11/13/01 & 11/14/01
  - Spoke with Stuart at 10:46
    - He said the address listed for the well location was once an address associated with his property. Also, before he bought the property, one of the buildings on it burned down. **He does not know where the well is on the site, and has never used it.** He said "it's abandoned".

Well Number 2:

11/12/01

- -Called Multnomah County Records Office 503-988-3375 (property ownership and taxation department - ext. 3)
  - **1991 NWUpshur St.** is address listed on well record
    - Owner is **Bruce Boles**
      - 2770 SW Patten Lane, Portland, Oregon, 97201
- White pages (www.switchboard.com) found "Boles, Bruce"
  2770 SW Patten Lane Portland, Oregon, 97201 **503-228-0606**
  - Spoke with Bruce at 16:16
    - He said the **well is covered with wood and has not been in use since he bought the property**. He said "it's abandoned".

Well Number 3:

11/01/01

- -Called Multnomah County Records Office 503-988-3375 (property ownership and taxation department - ext. 3)
  - **2439 NW 22nd Ave.** is address listed on well record
    - Owner is **Griffith Rubber Mills**
      - 2625 NW Industrial St., Portland, Oregon, 97210
- Yellow pages (www.qwestdex.com) found "Griffith Rubber Mills"
  2625 NW Industrial St., Portland, Oregon, 97210 **503-226-6971**
  - Asked for facilities manager: **Ron Burr**
  - Spoke with Ron at 12:00
    - He said the building is gone and no one is using the property. He also said the **well is not in use.**

Well Number 4:

11/12/01

- -Called Multnomah County Records Office 503-988-3375 (property ownership and taxation department - ext. 3)
  - **2300 NW Nicolai St.** is address listed on well record
    - Owner is **Ralph Dwyer**
      - 2811 SW Arrowhead Ct., Lake Oswego, Oregon, 97034
- White pages (www.switchboard.com) found "Dwyer, Ralph"
  2811 SW Arrowhead Ct., Lake Oswego, Oregon, 9703 **503-636-5241**
  - Spoke with Ralph at 16:40
    - He said the **well was covered with concrete about 12 years ago, and is not in use.**

Well Number 5:

- Well was located at the Terminal 1 South complex; there is no record or known location on the property

Well Number 6:

11/13/01

- Yellow pages (www.qwestdex.com) did not find "Ice Coliseum"
- Yellow pages (www.switchboard.com) did not find "Ice Coliseum"
- Called Multnomah County Records Office 503-988-3375 (property ownership and taxation department - ext. 3)
  - **No address** is listed on well record
  - No business with that name in easily obtainable through county records

STATE ENGINEER
Salem, Oregon

MULT 1015

Well Record

STATE WELL NO. 1N/1-28Q2
COUNTY Multnomah
APPLICATION NO.

OWNER: Portland Ice & Cold Storage
MAILING ADDRESS: 1810 N. W. 18th

LOCATION OF WELL: Owner's No.
CITY AND STATE: Portland, Oregon

____ ¼ ____ ¼ Sec. ____ T. ____ N./S., R. ____ E./W., W.M.

Bearing and distance from section or subdivision corner

Altitude at well

TYPE OF WELL: Drilled Date Constructed

Depth drilled ____ Depth cased ____

Section

CASING RECORD:

FINISH:

AQUIFERS:

WATER LEVEL:

PUMPING EQUIPMENT: Type Turbine H.P.
Capacity 150 G.P.M.

WELL TESTS:
Drawdown ____ ft. after ____ hours ____ G.P.M.
Drawdown ____ ft. after ____ hours ____ G.P.M.

USE OF WATER Industrial Ammonia Condensers Temp. ____ °F. ____, 19__
SOURCE OF INFORMATION Mr. Monahan Public Works Dept.
DRILLER or DIGGER
ADDITIONAL DATA:
Log ____ Water Level Measurements ____ Chemical Analysis ____ Aquifer Test ____

REMARKS:

State Printing

POPT1S601629

STATE ENGINEER
Salem, Oregon

MULT
1014

Well Record

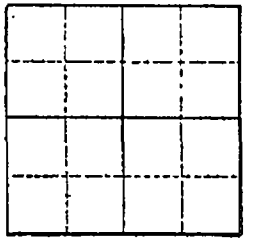
STATE WELL NO. 1N/1-28Q1
COUNTY Multnomah
APPLICATION NO. _____

OWNER: Blitz Weinhardt Co. MAILING ADDRESS: 1991 N. W. Upshur

LOCATION OF WELL: Owner's No. _____ CITY AND STATE: Portland, Oregon

____¼ ____¼ Sec. ____ T. ____ N. S., R. ____ E. W., W.M.

Bearing and distance from section or subdivision corner _____



Altitude at well _____

TYPE OF WELL: _____ Date Constructed _____

Depth drilled 50 Depth cased _____

Section _____

CASING RECORD:

FINISH:

AQUIFERS:

WATER LEVEL:

PUMPING EQUIPMENT: Type Deming-Mueller H.P. 1½
Capacity 40 G.P.M.

WELL TESTS:
Drawdown _____ ft. after _____ hours _____ G.P.M.
Drawdown _____ ft. after _____ hours _____ G.P.M.

USE OF WATER Industrial cooling condenser Temp. _____ °F. _____, 19__
SOURCE OF INFORMATION Mr. Monahan, Portland Public Works Dept.
DRILLER or DIGGER _____
ADDITIONAL DATA:
Log _____ Water Level Measurements _____ Chemical Analysis _____ Aquifer Test _____

REMARKS:

(2)

POPT1S601630

STATE ENGINEER
Salem, Oregon

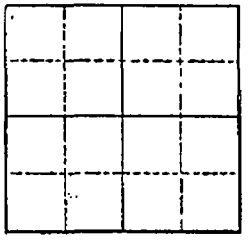
MULT 1013

Well Record

STATE WELL NO. 1N/1-28M(1)
COUNTY Multnomah
APPLICATION NO.

OWNER: Griffith Rubber Mills
MAILING ADDRESS: 2439 N. W. 22nd
CITY AND STATE: Portland, Oregon

LOCATION OF WELL: Owner's No.
NW ¼ SW ¼ Sec. 28 T. 1 N. S., R. 1 E. W., W.M.
Bearing and distance from section or subdivision corner



Altitude at well
TYPE OF WELL: Drilled Date Constructed Aug. '46
Depth drilled 395' Depth cased 395'
Section 28

CASING RECORD:

8 inch steel casing reduces to 6 inch at 188 feet
6 inch steel casing set to 395 feet (or 207' of 6" casing)

FINISH:

open end casing

AQUIFERS:

Basalt

WATER LEVEL:

32 feet below land surface August 1946

PUMPING EQUIPMENT: Type Turbin 8" Elect. H.P. 40
Capacity 250 G.P.M.

WELL TESTS:
Drawdown ft. after hours G.P.M.
Drawdown ft. after hours G.P.M.

USE OF WATER Industrial cooling rubber Temp. 58 °F. , 19
SOURCE OF INFORMATION U.S.G.S. well schedule
DRILLER or DIGGER A. M. Jannsen
ADDITIONAL DATA:
Log X Water Level Measurements Chemical Analysis X Aquifer Test

REMARKS:

Well originally 120 feet deep - deepened by A. M. Jannsen on August 27, 1946 to 395 feet.

State Printing

3

POPT1S601631

STATE ENGINEER
Salem, Oregon

State Well No. 1N/1-28M(1)
County Multnomah
Application No.

Well Log

Owner: Griffith Rubber Mills Owner's No.

Driller: A. M. Jannsen Date Drilled August 1946

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Rock, sandy	0	22	22
Gravel, big	22	32	10
Gravel	32	45	13
Sand and gravel	45	65	20
Gravel	65	94	29
Gravel, muddy	94	111	17
Gravel	111	120	9
Gravel, loose.	120	141	21
Gravel, cement	141	143	2
Gravel, loose	143	165	22
Sand and gravel	165	185	20
Sand	185	195	10
Sand-rock (contact ?)	195	198	3
Clay, red	198	285	87
Rock, sand	285	288	3
Rock, lava	288	291	3
Rock, hard	291	395	104

STATE ENGINEER
Salem, Oregon

State Well No. 1N/1-28M 1
County Multnomah
Application No. _____

Chemical Analysis

OWNER Griffith Rubber Mills OWNER'S NO. _____

ANALYST Flex Company Address 2439 NW 22nd Ave.

Date of Collection 9/10/46

Point of Collection well

	P.P.M.	E.P.M.	G.P.G.
Silica (SiO_2)	50		2.95
Iron (Fe) Total			
Manganese (Mn)	9		0.5
Calcium (Ca)			
Magnesium (Mg)			
Sodium (Na)			
Potassium (K)			
Bicarbonate (HCO_3)			
Carbonate (CO_3)			
Sulfate (SO_4)	44		2.6
Chloride (Cl) NaCl	286		15.8
Fluoride (F)			
Nitrate (NO_3)			
Boron (B)			
Dissolved Solids	496		29.0
Hardness as $CaCO_3$	67		3.9
Specific Conductance (Micromhos at 25°C)			
pH	7.9 well (7.1 City Water)		
Percent Sodium			
Sodium Absorption Ratio (S.A.R.)			
CLASS			

State Printing 6M13

STATE ENGINEER
Salem, Oregon

MULT
1011

Well Record

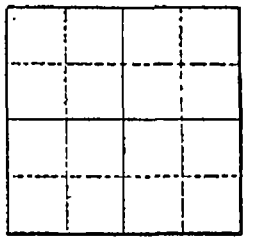
STATE WELL NO. 1N/1-28E(1)
COUNTY Multnomah
APPLICATION NO. _____

OWNER: A. Young & Son Iron Works
MAILING ADDRESS: 2300 N. W. Nicolai Street
CITY AND STATE: _____

LOCATION OF WELL: Owner's No. _____

____¼ ____¼ Sec. ____ T. ____ N. S., R. ____ E. W., W.M.

Bearing and distance from section or subdivision corner _____



Altitude at well _____

TYPE OF WELL: Drilled. Date Constructed 1942

Depth drilled 77 Depth cased _____ Section _____

CASING RECORD:

4 inches

FINISH:

AQUIFERS:

WATER LEVEL:

PUMPING EQUIPMENT: Type _____ H.P. _____
Capacity 10 G.P.M.

WELL TESTS:
Drawdown _____ ft. after _____ hours _____ G.P.M.
Drawdown _____ ft. after _____ hours _____ G.P.M.

USE OF WATER Industrial, tempering steel Temp. _____ °F. _____, 19__
SOURCE OF INFORMATION _____
DRILLER or DIGGER _____
ADDITIONAL DATA:
Log _____ Water Level Measurements _____ Chemical Analysis _____ Aquifer Test _____

REMARKS:
Not in use - 1960

State Printing 0000

4

POPT1S601634

STATE ENGINEER
Salem, Oregon

MULT 1016

Well Record

STATE WELL NO. 1N/1-28R1
COUNTY Multnomah
APPLICATION NO.

OWNER: Commission of Public Docks
MAILING ADDRESS: 1884 N. W. Front Avenue
LOCATION OF WELL: Owner's No.
CITY AND STATE: Portland, Oregon

SE ¼ SE ¼ Sec. 28 T. 1 N., R. 1 E., W.M.

Bearing and distance from section or subdivision corner

Altitude at well

TYPE OF WELL: Drilled Date Constructed July '41

Depth drilled 142 Depth cased

Section

CASING RECORD:

8 inch steel casing

FINISH:

AQUIFERS:

WATER LEVEL:

PUMPING EQUIPMENT: Type Turbine H.P. 5
Capacity 100 G.P.M.

WELL TESTS:
Drawdown ft. after hours G.P.M.
Drawdown ft. after hours G.P.M.

USE OF WATER Air conditioning Temp. 58 °F. , 19

SOURCE OF INFORMATION Mr. Monahan Public Works Dept

DRILLER or DIGGER

ADDITIONAL DATA:
Log Water Level Measurements Chemical Analysis Aquifer Test

REMARKS:

State Printing 14216

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POPT1S601635

STATE ENGINEER
Salem, Oregon

MUL
1044

Well Record

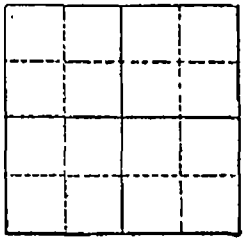
STATE WELL NO. 1N/1-35Q1
COUNTY Multnomah
APPLICATION NO. _____

OWNER: Ice Coliseum
MAILING ADDRESS: _____
CITY AND STATE: _____

LOCATION OF WELL: Owner's No. _____

_____¼ _____¼ Sec. _____ T. _____ N. S. R. _____ E. W., W.M.

Bearing and distance from section or subdivision corner _____



Altitude at well _____

TYPE OF WELL: _____ Date Constructed _____

Depth drilled _____ Depth cased _____ Section _____

CASING RECORD:

FINISH:

AQUIFERS:

WATER LEVEL:

PUMPING EQUIPMENT: Type _____ H.P. _____
Capacity 75 G.P.M.

WELL TESTS:
Drawdown _____ ft. after _____ hours _____ G.P.M.
Drawdown _____ ft. after _____ hours _____ G.P.M.

USE OF WATER _____ Temp. _____ °F. _____ 19____
SOURCE OF INFORMATION _____
DRILLER or DIGGER _____
ADDITIONAL DATA:
Log _____ Water Level Measurements _____ Chemical Analysis _____ Aquifer Test _____

REMARKS:

State Printing [illegible]

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POPT1S601636